THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

[Registered as a Newspaper.]

Vol. XXXII. No. 803.] LONDON, OCTOBER 1, 1878. [30th Year.] Price 6d.

GAS PURIFICATION
BY
OXIDE OF IRON.

COOKE BROS.,
26, 27, & 28, FENCHURCH ST.,
LONDON, E.C.

SPENT OXIDE PURCHASED IN ANY QUANTITY.

GENUINE TORBAY PAINT
And SPECIAL GASOMETER PAINT.
Several Prize Medals. Established over 20 Years.
These Paints are now used in over 200 Country Gas-Works, and by all the London Gas Companies, on Gas-holders, Scrubbers, Purifiers, &c. Also used by the Admiralty, War Office, Railway Companies, Founders, &c. They prevent and arrest rust, and protect iron from the action of water, sulphurous and gaseous exhalations; do not crack, blister, or flake off; will cover tar effectually.
The covering powers are considerably greater than those of any other Paint.—*See "Engineer," Nov.* 2, 1866.
Supplied, mixed ready for use, or in paste, as desired.
TORBAY PAINT COMPANY.
Proprietors: STEVENS & CO.,
21, GREAT WINCHESTER STREET, LONDON.
Works: BRIXHAM, TORBAY.

THOMAS PROUD,
BROOKFIELD GAS APPARATUS WORKS,
103, ICKNIELD STREET EAST, BIRMINGHAM.

CONTRACTOR FOR
LAYING MAINS
FOR
Gas, Water, & Sanitary Purposes,
AND MANUFACTURER OF
WOOD GRIDS
FOR
SCRUBBERS AND PURIFIERS.

COWEN'S PATENT FIRE-CLAY RETORTS.
JOSEPH COWEN and CO.,
BLAYDON BURN, BLAYDON-ON-TYNE,
Were the only parties to whom a Prize Medal was awarded at the Great Exhibition of 1851, for "Gas-Retorts and other Objects in Fire-Clay," and they were also awarded at the International Exhibition of 1862, the Prize Medal for "Gas-Retorts, Fire-Bricks, &c., for Excellence of Quality."
J. C. and Co. have been for many years the most extensive Manufacturers of Fire-Clay Retorts and Fire-Bricks in the Kingdom. Orders for Fire-Clay Retorts of all shapes and dimensions, and to fit any shaped Mouthpiece, Fire-Bricks, and every other article in Fire-Clay, are promptly executed at their Works as above.
COWEN'S GARESFIELD COALS.
Jos. Cowen & Co. are the only Manufacturers of Fire-Bricks and Clay Retorts at Blaydon Burn.

JOHN RUSSELL AND CO.,
LIMITED,
Established at the commencement of Gas Lighting.
Branch Establishments:
48, GREEK STREET, SOHO SQUARE;
83, COMMERCIAL ST., SPITALFIELDS; } LONDON.
35, 36, 37, & 39, GRANBY ROW, MANCHESTER.
16, ELLIS COURT, AIRE STREET, LEEDS.
Manufactories: ALMA TUBE WORKS, WALSALL, and OLD PATENT TUBE WORKS, WEDNESBURY.
J. R. & Co., Ld., are the original manufacturers of Wrought-Iron Gas Tubes and Fittings, and Inventors of the LAP-WELDED TUBES for Locomotive and Marine Boilers.
J. R. & Co., Ld., make all kinds of Tubes and Fittings for Gas, Steam, and Water; Gun-Metal Cocks, Stocks, and Dies; Galvanized Tubes and High-Pressure Tubes, &c.
Lists may be obtained on application to
Head London Office:
145, QUEEN VICTORIA STREET.
Head London Warehouse:
234, UPPER THAMES STREET, LONDON, E.C.

JOHN BENT & SON,
BELL BARN ROAD, BIRMINGHAM,
Manufacturers of
WET AND DRY GAS-METERS,
Licensees and Manufacturers of
HUNT'S
PATENT COMPENSATING METERS,
STREET-LAMPS, &c., &c.
Established 1830.

THOMAS PIGGOTT & CO.,
SPRING HILL, BIRMINGHAM,
Manufacturers of
TELESCOPIC & SINGLE GASHOLDERS,
CAST & WROUGHT IRON TANKS FOR DITTO,
And Gas Apparatus of every Description.
Marine, Tubular, Cornish, Plain, Furnace, Saddle, and Range Boilers.
Sugar, Saltpetre, and all kinds of Pans.
Roofs, Girders, and Bridges, and General Smith's Work.

J. & H. ROBUS,
BUILDERS AND CONTRACTORS
FOR THE
ERECTION AND REBUILDING OF GAS AND WATER WORKS.
ESTIMATES FREE
FOR MAIN-LAYING AND GENERAL REPAIRS
RETORT-SETTING A SPÉCIALITÉ.
ROBUS'S IMPROVED RETORT-SETTINGS guaranteed to carbonize a large amount of coal with a small per cent. of fuel.
N.B.—All kinds of Fire Goods, &c., kept in stock for immediate delivery. Orders promptly attended to.
BELL GREEN, CATFORD, S.E.

THE
NITSHILL COMPANY'S
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AGENT:
JAMES M'KELVIE,
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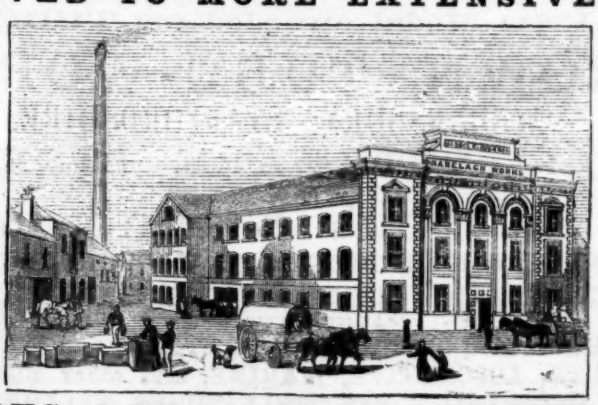
CHANGE OF ADDRESS.
GEORGE GLOVER AND CO.,
DRY GAS-METER MANUFACTURERS,
HAVE REMOVED TO MORE EXTENSIVE PREMISES:



RANELAGH WORKS, ROYAL AVENUE, CHELSEA, LONDON, S.W.

SILVER MEDAL, PARIS EXHIBITION, 1867.

LLOYD AND LLOYD,

ALBION TUBE-WORKS, BIRMINGHAM,
AND
COOMBS WOOD TUBE-WORKS, HALESOWEN,
MANUFACTURERS OF
WROUGHT-IRON TUBES AND FITTINGS,
AND
LAP-WELDED IRON AND HOMOGENEOUS METAL BOILER TUBES,
UP TO FOUR FEET IN DIAMETER.

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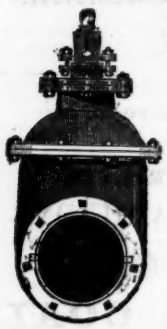
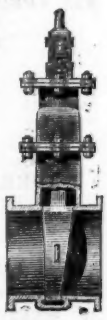
JOSEPH AIRD,

WELLINGTON TUBE-WORKS, TIPTON, STAFFORDSHIRE,
MANUFACTURER OF
EVERY DESCRIPTION OF TUBING, GAS, STEAM, HYDRAULIC TUBES AND FITTINGS,
EITHER BLACK, GALVANIZED, OR ENAMELLED HOT WATER TUBES AND FITTINGS,
CORE BARS, COILS, COCKS (IRON OR BRASS),
CHANDELIERS, &c., GAS-FITTERS' TOOLS, GAS TONGS, STOCKS, TAPS, DIES, &c., &c.,
HANDRAIL TUBINGS, IRON AND BRASS, PLAIN OR TWISTED,
TELEGRAPH TUBES OR POLES, &c., &c.



C. & W. WALKERS' DOUBLE-FACED GAS-VALVES.



These solidly constructed double-faced Gas-Valves have taken the place of the old system of the light, single-faced disc, which is too uncertain and unreliable in large bores.

They are guaranteed absolutely gas-tight. They are very massive and rigid, and by improved modes of manufacture they are produced at very little excess in cost over the old light, weak system, which is liable to spring and bend, and become leaky.

The Valve is a rigid wedge of solid cast iron, having two perfectly scraped surfaced facings fitting between the two on the body, which are also surfaced.

A spring in two short halves, and, therefore, not liable to break, is used only for scraping the front facing clean.

The front facing is vertical; the back facing forms the wedge.

At a slight additional expense both flanges are faced to bolt to main-pipes.

MIDLAND IRON-WORKS,
DONNINGTON, near NEWPORT, SHROPSHIRE; 8, FINSBURY CIRCUS, LONDON.

ROBT. DEMPSTER & SONS,

GAS ENGINEERS, IRONFOUNDERS, AND CONTRACTORS,
ROSE MOUNT IRON-WORKS, ELLAND, YORKSHIRE.
MANUFACTURERS OF EVERY DESCRIPTION OF
GAS APPARATUS;
CONTRACTORS FOR THE
ERECTION OF PUBLIC AND PRIVATE GAS-WORKS.

Plans and Specifications Prepared, and Illustrated Catalogues forwarded on application.

TRADE MARK

THE MEDAL FOR 1862.
The only Prize Medal awarded for TUBES & FITTINGS.

CROWN TUBE-WORKS,

WEDNESBURY, STAFFORDSHIRE.
WAREHOUSE: SOUTHWARK STREET, LONDON.

JAMES RUSSELL & SONS, LIMITED,

PATENTEES & FIRST MAKERS OF WROUGHT-IRON TUBES,
ONLY MAKERS OF HOMOGENEOUS METAL TUBES.
MANUFACTURERS OF
TUBES and FITTINGS for GAS, STEAM, and WATER;
LAP-WELDED, LOCOMOTIVE, MARINE, and other BOILER TUBES;
HYDRAULIC TUBES, BEDSTEAD TUBES, WELL TUBES, TELEGRAPH POSTS, COILS, &c.;
GAS-FITTERS TOOLS, VALVES, COCKS, &c.

THOMAS PIGGOTT & CO.,

(Established 1822,)

SPRING HILL, BIRMINGHAM.

MANUFACTURERS OF

TELESCOPIC & SINGLE GASHOLDERS,

CAST & WROUGHT IRON TANKS FOR DITTO;

PURIFIERS, CONDENSERS, SCRUBBERS, RETORTS, VALVES;

IMPROVED WROUGHT-IRON RETORT-LIDS, CROSS-BARS, & SCREWS;

AND GAS APPARATUS OF EVERY DESCRIPTION.

SOLE MANUFACTURERS OF LIVESEY'S PATENT GASHOLDER MAN-LID,

By use of which Man-lid, inlet and outlet pipes can be examined and cleansed without loss of gas in crown of holder, or ingress of atmospheric air.

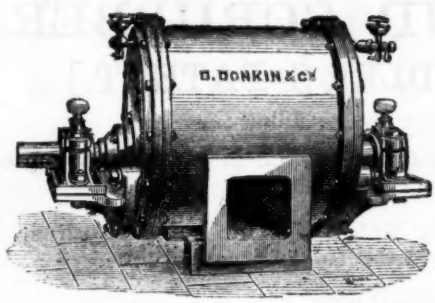
ROOFS, GIRDERS, BRIDGES, AND BOILERS OF ALL KINDS.

Drawings, Specifications, and Estimates supplied on application.

J. BEALE'S NEW PATENT GAS EXHAUSTERS

MANUFACTURED SOLELY BY

B. DONKIN & Co.



These Exhausters have but one solid slide, which ensures less wear and friction, and thus fewer repairs are necessary. They are made with two outside bearings and with all latest improvements.

MESSRS. B. D. & Co. ALSO MAKE

STEAM-ENGINES FOR DRIVING GAS EXHAUSTERS.
IMPROVED GAS-VALVES.
VALVES FOR AMMONIACAL LIQUOR, TAR, and HYDRAULIC MAINS,
VALVES FOR SPECIAL PURPOSES, WITH COLUMNS, SCALES, AND GAUGES.
STEAM, GAS THROTTLE, AND BYE-PASS VALVES.
SCREW WATER-VALVES, &c.

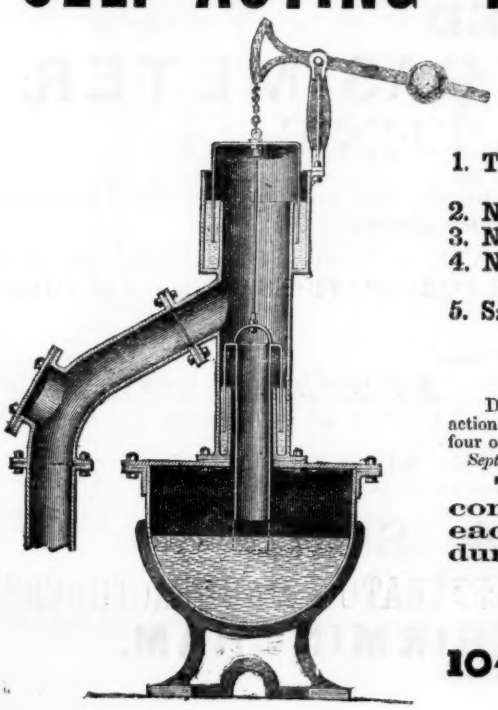
LISTS, PRICES, AND INFORMATION ON APPLICATION.

WORKS: 55a, BLUE ANCHOR ROAD, BERMONDSEY, LONDON, S.E.

SELF-ACTING REMOVABLE DIP-PIPE,

PATENTED BY

CHANDLER & STEVENSON.



ADVANTAGES.

1. There is no pressure on the Retorts.
2. No deposit of Carbon.
3. No scurfing is required.
4. Never a choked Ascension-Pipe.
5. Saves Fuel and Wear and Tear.
6. Gets 10 per cent. more Gas out of the Coal, and a higher Illuminating Power.
7. Is never out of order.
8. Requires no attention.
9. Is perfectly automatic in its action.

Testimonial from the Proprietor of the Apeldorn Gas-Works.

DEAR SIR,—In reply to your inquiry, the Self-Acting Dip-Pipes, which have been in action at my works for two years, give entire satisfaction. I forward you order for four others.

Yours truly,

Sept. 9, 1877. R. BAKKER.

These Dip-Pipes can now be supplied complete, except the flanched bend, for £4 each, which includes the charge for licence during the whole term of the patent.

APPLICATIONS TO BE MADE TO

Messrs. CHANDLER & SONS,

104, NEWINGTON CAUSEWAY, S.E.,

Who fix the Dip-Pipes, at a small Charge, when required.

GAS PURIFICATION

BY

OXIDE OF IRON.

GAS PURIFICATION & CHEMICAL Co., LIMITED,

PALMERSTON BUILDINGS, OLD BROAD STREET, LONDON, E.C.

JOHN WM. O'NEILL, Managing Director.

SULPHATE AMMONIA.

R. W. WALLACE & CO.,

60, MARK LANE, LONDON, E.C.,

Are Buyers of SULPHATE AMMONIA in Large or Small Quantities, or Sell on Commission for Gas Companies and Makers.

PLANT ERECTED ON THE LATEST AND MOST APPROVED PRINCIPLE.

AGENTS to THE GASLIGHT AND COKE COMPANY, LONDON, for the SALE of SULPHATE AMMONIA. Works: BECKTON.

THE

STANDARD WASHER AND SCRUBBER.

[KIRKHAM, HULETT, AND CHANDLER'S PATENT.]

Some of the advantages claimed for this Apparatus are as follow:—

The Exposing of a large Amount of Effectually-wetted Surface (which is continually reproduced) to act upon the Gas.
Unerring Regularity in the Distribution of the Liquor.
Saving of Expense in Providing and Exchanging Scrubbing Material—none being required.
Economy of Space, thus enabling the Apparatus to be protected from the Weather.
Economy of First Cost and of Maintenance.
It works without Pressure.
It is particularly adapted for Gas-Works where Sulphate of Ammonia is manufactured.

Applications for Prices, &c., to be made to

Messrs. KIRKHAM & HERSEY, GAS ENGINEERS, 21, ABINGDON STREET, WESTMINSTER.

IMPROVED
COMPENSATING GAS-METER.
HUNT'S PATENT.

This Meter supplies a want long felt, by putting an end to the loss sustained by Gas Companies through the overworking of their Meters.

These Meters can now be supplied in either TIN-PLATE or CAST-IRON CASES, and OLD METERS converted to this plan. GAS COMPANIES and CORPORATIONS will find it to THEIR ADVANTAGE to adopt these Meters.

EXTRACTS FROM REPORTS.

"I am able to report that the Meters have given in each test most satisfactory results."—*Mr. H. Sporne, City of London Meter Inspector.*
"I consider the arrangement is a great improvement upon the Meters in present general use."—*Mr. T. Jackson, Meter Inspector, Birmingham.*
"I would observe from the results of my testings that the Meters are a great improvement on the ordinary Wet Meters in general use."—*Mr. H. Airey, Meter Inspector to the Metropolitan Board of Works.*

COPIES OF REPORTS SENT ON APPLICATION.

MANUFACTURED BY

JOHN BENT & SON,

WET AND DRY GAS-METER AND GAS APPARATUS MANUFACTURERS,

BELL BARN ROAD, BIRMINGHAM.

Established 1830.

GEORGE ORME & CO.,

ATLAS METER-WORKS, OLDHAM,

MANUFACTURERS OF

WET AND DRY GAS-METERS,

STATION-METERS, GOVERNORS,

PRESSURE AND EXHAUST REGISTERS,

LAMP-METERS IN CAST-IRON BOXES,

And every Description of Gas Apparatus.

J. T. B. PORTER & CO.,

GAS ENGINEERS & MANUFACTURERS,

IRONFOUNDERS AND CONTRACTORS,

GOWTS BRIDGE WORKS,

LINCOLN.

LONDON OFFICES: 1, WESTMINSTER CHAMBERS, S.W.

ESTIMATES FOR GAS-WORKS OF ANY SIZE.

REFERENCES TO 500 WORKS ALREADY ERECTED.

N.B.—All Communications to be addressed to the FIRM ONLY.

J. & J. BRADDOCK,

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GLOBE METER-WORKS, OLDHAM,

MANUFACTURERS OF

WET & DRY CONSUMERS GAS-METERS,

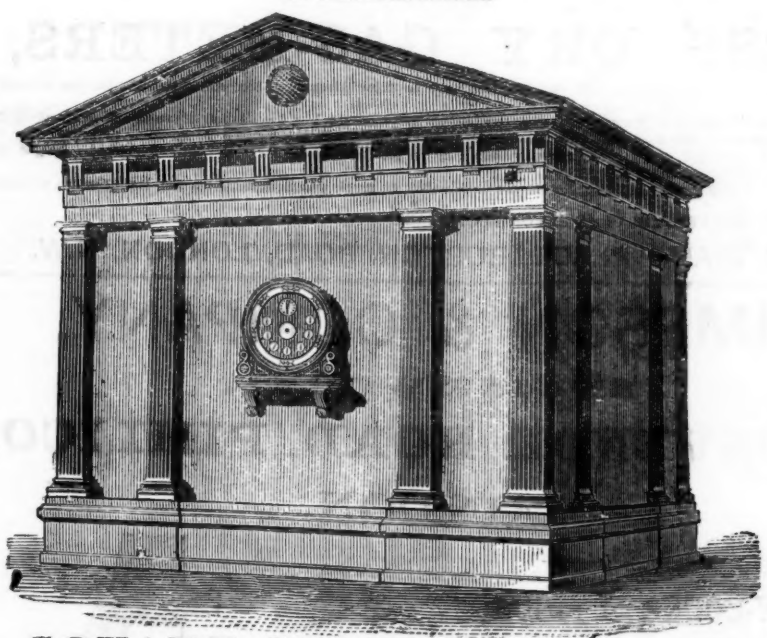
OF THE HIGHEST EXCELLENCE ONLY;

ALSO LICENSEES AND MANUFACTURERS OF

WARNER & COWAN'S PATENT SELF-REGULATING GAS-METERS;

ROUND STATION-METERS,

ON CAST-IRON STANDS.



SQUARE STATION-METERS,

WITH PLANED JOINTS.

GOVERNORS, GAUGES, INDICATORS, MAIN COCKS, &c.

GAS COOKING APPARATUS.

Home and Foreign Orders promptly attended to.

All Sizes of CONSUMERS METERS, STATION-METERS, and GOVERNORS generally in Stock.

Orders almost invariably despatched on the day of receipt.

TERMS, &c. ON APPLICATION.

C. & W. WALKER'S

WOOD PURIFIER SIEVES,

Which have now been used for fifteen years, and their advantages and durability fully established. They are made entirely by steam machinery in very large quantities at the most moderate cost.

MIDLAND IRON-WORKS,

DONNINGTON, NEAR NEWPORT, SHROPSHIRE.

2, FINSBURY CIRCUS, LONDON.

ESTABLISHED IN 1860.

BENJAMIN CARPENTER,

THE ORIGINAL MANUFACTURER OF THE IMPROVED

WOOD SIEVES

FOR

GAS PURIFIERS & SCRUBBERS.

PROVIDENCE WORKS,

22, HERMES STREET, PENTONVILLE ROAD

LONDON, N.

DEMPSTER & SONS'

RENOWNED

WOOD SIEVES,

WITH TAPER BARS,

MADE BY MACHINERY

CAPABLE OF MAKING 10,000 FEET WEEKLY.

References to Hundreds of First-Class Engineers.

ROSE MOUNT IRON-WORKS,

ELLAND, NEAR HALIFAX.

JOHN ROMANS, C.E., F.G.S.E.,

CONSULTING GAS ENGINEER

AND

CANNEL COAL FACTOR,

30, St. Andrew Square, EDINBURGH.

Plans and Estimates furnished; Gas-Works, Apparatus, Pipes, Machinery, Fire Goods, &c., supplied, or Attested and Shipped for Exportation.

GAS-WORKS TAKEN ON LEASE.

Mr. ROMANS has for upwards of 30 years been practically engaged in the Manufacture of Gas, and has, by extensive experiments, ascertained that by JUDICIOUS INTER-MIXTURE of the lighter with the heavier gases, much of the rich Hydrocarbons CAN BE SAVED, which otherwise ARE LOST, during the process of manufacture. He is therefore enabled to give advice to those who favour him with their orders for Cannel, as to the class which will secure for their standard of illuminating power the HIGHEST ADVANTAGEOUS RESULTS.

ANALYSIS AND PRICES FORWARDED ON APPLICATION.

GRIRDROD'S PATENT

PORTABLE PIPE SCREWING

MACHINE,

For 1 in., 1¼ in., 1½ in., and 2 in. Gas Threads, complete £7 10s.

In use at the chief gas-works, and giving great a tisfaction.

For other useful goods, see Bailey's "Illustrated Inventions," post free 3s. 6d.; gratis to ledger customers.

W. H. BAILEY & CO.,

Brassfounders, Gauge Injector and Tool Makers,

ALBION WORKS, SALFORD,

LANCASHIRE.

THOMAS TURTON AND SONS,

SHEAF AND SPRING WORKS,

SHEFFIELD,

MANUFACTURERS OF

FILES OF BEST QUALITY

FOR ENGINEERS,

STEEL OF ALL DESCRIPTIONS,

SCREW STOCKS, TAPS, AND DIES, SPANNERS

RATCHET BRACES, LIFTING-JACKS,

ANVILS, VICES,

AND ENGINEERS TOOLS GENERALLY

LONDON WAREHOUSE:

90. CANNON STREET, E.C.

R. W. WINFIELD AND CO.,

CAMBRIDGE STREET WORKS AND ROLLING MILLS,

BIRMINGHAM.

The following Medals have been awarded:—

GRAND COUNCIL MEDAL, LONDON, 1851. | MEDAL, LONDON, 1862.

GOLD MEDAL, PARIS, 1867,

The only Gold Medal awarded for "Apparatus and Processes for Heating and Lighting" by the Imperial Commissioners.

MEDAL FOR PROGRESS, VIENNA, 1873.

MANUFACTURERS OF BRASS AND COPPER SHEETS,

TUBE AND WIRE,

ROLLED METALS, LOCOMOTIVE AND CONDENSER TUBES, CYLINDERS;

Ornamental, Taper, and Cased Tubes;

TIN TUBES;

GAS-FITTINGS, CHANDELIERS,

BRACKETS FOR HEATING AND LIGHTING;

METALLIC BEDSTEADS.

Ecclesiastical and Mediæval Metal Workers.

GENERAL BRASSFOUNDERS.

REGISTERED TRADE MARK:
R. W. W. & CO.

LONDON OFFICES & SHOW-ROOMS: 141, FLEET STREET, E.C.

EDWARD E. CROMBIE & CO.,

INVENTORS AND PATENTEES
OF THE

FRICTIONLESS DRY GAS-METERS,

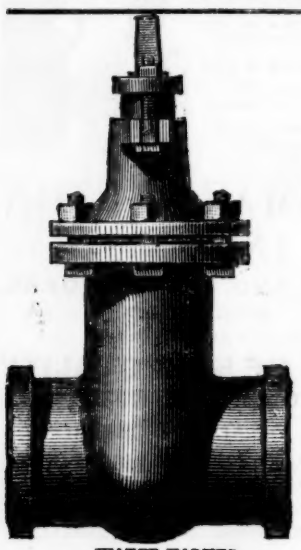
Beg to intimate to Gas Companies and others that they are now prepared to supply these very superior Meters at the same prices as for the ordinary Gas-Meters.

In the construction of this Meter, for which the best tin plates only are used, every mechanical contrivance has been taken advantage of successfully to reduce the friction to a minimum, which is amply proved by the fact that they are made to work upon only one-fortieth of an inch pressure. By an improvement also in their construction, a steadier light is obtained, and greater capacity than can be got from any other Meter in the market. No gas can pass under the valves on any back pressure, as is the case with many other Dry Meters.

To Gas Companies supplying gas through streets with heavy gradients, these Meters are invaluable, as much gas is saved from the low pressure required to work them.

ALL METERS ARE UPHELD FOR FIVE YEARS.

METROPOLITAN WORKS, DIANA PLACE, EUSTON ROAD, LONDON, N.W.



WATER-VALVES.
All Sizes, Flange and Socket, kept in Stock, tested to 1000 feet head.

SIMPSON & COMPANY,

ENGINE-WORKS,

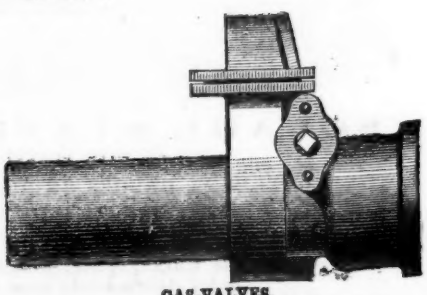
GROSVENOR ROAD, PIMLICO,

LONDON.

SCREW-COCKS, HYDRANTS,
SLUICES, PENSTOCKS,

And all other Machinery for

WORKS OF WATER SUPPLY, DRAINAGE AND IRRIGATION.



GAS-VALVES.
All Sizes, Flange and Socket, kept in Stock, tested to 100 feet head.

TANGYE BROTHERS AND HOLMAN,

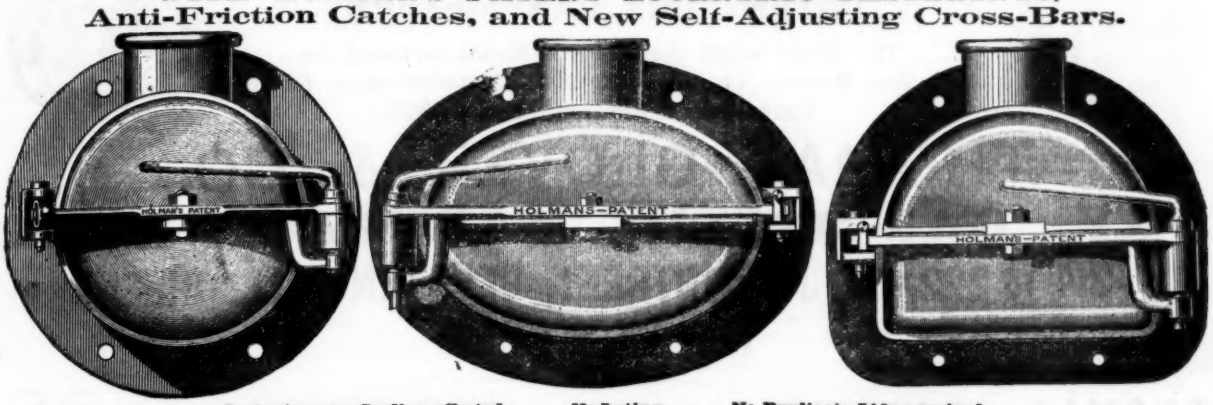
CORNWALL HOUSE, 35, VICTORIA ST., LONDON, E.C.

(LATE OF 10, LAURENCE POUNTNEY LANE.)

SOLE MAKERS OF MORTON'S PATENT SELF-SEALING RETORT-LIDS,

WITH HOLMAN'S PATENT ECCENTRIC FASTENINGS,

Anti-Friction Catches, and New Self-Adjusting Cross-Bars.



Instantaneous Sealing effected. No Luting. No Duplicate Lids required.

Holman's New Self-Sustaining Cross-Bar ensures freedom of Joint, and maintains parallel position of the Lids.

Since their introduction in 1869, these Patent Retort-Lids have been thoroughly tested, being now in use in nearly all the principal Gas-Works in London and the Provinces.

T. B. and H. are now making the "Morton's Self-Sealing Lid" of the SAME FORM OR SECTION AS THE RETORT (see Illustrations above), as well as bringing the Mouthpiece from the D or Oval at back to Circular in front, as heretofore.

D and Oval Morton's Lids are working satisfactorily both in this country, on the Continent, and in the United States of America. Among others they have been adopted by the following Gas-Works:—

The Gaslight Company's Works, Fulham; Ditto, Bromley-by-Bow; Ditto, King's Cross; Ditto, Shoreditch.
And also in the Gas-Works at Richmond, Maidstone, Gloucester, Glasgow, Portsea, Roubaix (France), The Hague (Holland

HUNT'S PATENT EQUILIBRIUM GAS-GOVERNOR.

In this Governor a Throttle-Valve is substituted for the ordinary suspended Cone, all external communications being avoided by placing the Lever or Radius Arm (shown in the drawing) inside the Valve-Chamber upon the Disc. The Disc is carried upon steel centres, upon which it is accurately balanced and turns freely. The friction in working is thereby reduced to a minimum. This Governor is extremely sensitive to alterations of inlet or outlet pressure, and renders a large actuating holder unnecessary.

The principal advantages of this arrangement over the ordinary form of Governor are as follows:—

Its sensitive action prevents oscillation.

It is self-adjusting—*i.e.*, it maintains a steady pressure under variations of inlet pressure or a fluctuating consumption.

The inlet to Gasholder being contracted to the smallest possible dimensions, all danger from leakage through insufficiency of seal, tilting, &c., is entirely avoided.

The valve portion being separate from the holder, it can be handled and fixed like an ordinary Slide-Valve direct in the main; and the holder can be placed at an convenient distance immediately above it. The cost is thus materially reduced, and the inconvenience of heavy lifts done away with.

There are no working parts likely to get out of order.

These Governors have been adopted by many leading Gas Companies, among whom are the following:—

The Gaslight and Coke Co. (9), The London Gas Co. (3), and at Abergavenny, Arundel, Birmingham, Cannes (France), Devonport, Dursley, Exeter, Guernsey, Halesowen, Mentone (France), Monmouth, Newcastle-on-Tyne, Oxford, Plymouth, Rochdale, Windsor, &c.

TESTIMONIAL.

The Gaslight and Coke Company,
9, Water Street, New Bridge Street,
Blackfriars, E.C., Feb. 27, 1875.

MESSRS. TANGYE BROTHERS AND HOLMAN.

Gentlemen,—The two 24-inch and three 36-inch Hunt's Equilibrium Governors supplied by you, and fixed in the valve-rooms at Whitechapel, Goswell Road, and Blackfriars, are working very satisfactorily.

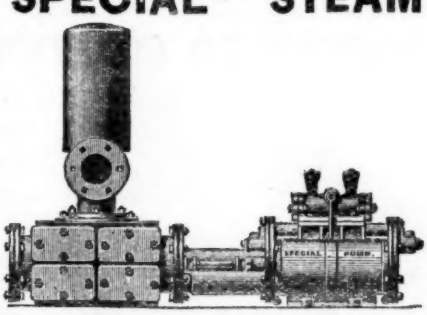
Yours truly,

(Signed) JOHN JOHNSON.

PRICES AND FULL PARTICULARS ON APPLICATION.

THE "SPECIAL" STEAM-PUMP.

Diameter of Steam Cylinder.	Diameter of Water Cylinder.	Length of Stroke.	Gallons of Water per Hour, Approximate.	Reduced Prices.
3	1½	9	450	£16
4	2	9	815	18
5*	2½	12	1,250*	20
5*	3	12	1,830*	22 10
4	4	12	3,250	25
6*	4	12	3,250*	30
5	5	12	5,070	32 10
7*	5	12	5,070*	40
6	6	12	7,330	40
8*	6	12	7,330*	50
7	7	12	9,750	50
10*	7	12	9,750*	65



In use in a Hundred Gas-Works in the United Kingdom for Pumping Ammoniacal Liquor, Water, or Tar.

Messrs. Burt, Boulton, and Haywood, Manufacturing Chemists, have over FORTY "Special" Steam-Pumps in use at their several large Tar-Works.

Two Hundred Sizes made. Those in Table opposite are the leading Sizes for use in Gas-Works and Chemical Works.

* These Sizes being usually selected for pumping Tar and Liquor, are always in stock, or nearly ready, fitted with all pump details in iron, and extra length distance-piece between steam and pump cylinder, at a small extra cost.

TANGYE'S HIGH-PRESSURE AND CONDENSING STEAM-ENGINES; CORNISH, VERTICAL, & TUBULAR BOILERS; HYDRAULIC AND SCREW LIFTING-JACKS, CRABS, PULLEY-BLOCKS, &c.

FULL PARTICULARS, ESTIMATES, CATALOGUES, ETC., ON APPLICATION.

London, 1851 New York. 1853. Paris, 1855. London. 1862.

Dublin, 1865.

The SIX MEDALS AWARDED to THOMAS GLOVER for

PATENT DRY GAS-METERS,

The latter being the Highest Medal awarded for Dry Gas-Meters by the Imperial Commissioners for the Universal Exhibition, Paris, 1867.

Paris, 1867.

THOMAS GLOVER & CO.,

DRY GAS-METER MANUFACTURERS,

214 TO 222, ST. JOHN STREET, CLERKENWELL GREEN,

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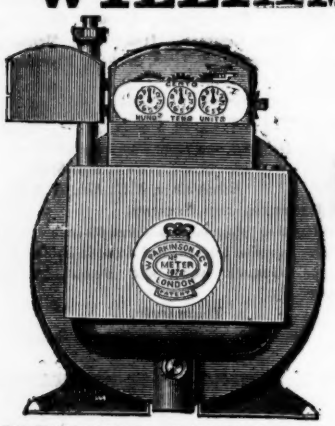
THOMAS GLOVER & CO.'S PATENT DRY GAS-METERS,

1st, Are a remedy for all the defects of Wet Meters;
2nd, Are suitable for all climates, whether hot or cold;
3rd, Incur no loss of Gas by evaporation;
4th, Cannot become fixed by frost, however severe;
5th, Are the most accurate and unvarying measurers of Gas;
6th, Prevent jumping or unexpected extinction of the Lights;
7th, May be fixed either above or below the level of the Lights;
8th, Cannot be tampered with, without visibly damaging the outer case;
9th, Will last much longer than Wet Meters;
10th, Will not cost more than one-half for repair that Wet or Water Meters do;
Are upheld for five years without charge.

WILLIAM PARKINSON AND CO.,



(ESTABLISHED 1816,)

MANUFACTURERS OF

WET & DRY METERS,

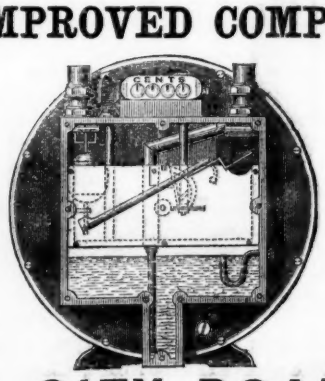
STATION-METERS & GOVERNORS,

EXHAUSTER REGULATORS,

PRESSURE REGISTERS, EXPERIMENTAL APPARATUS, GAUGES, WATER-METERS, &c.

HUNT'S PATENT IMPROVED COMPENSATING METER.

In this Meter, the action of the measuring-drum is reversed. By this arrangement an improvement is effected in the registration at high speeds, which, in many tests, has not varied from the smallest light to three times the capacity of the meter. It works equally well under all pressures. The range of error between the high and low line is much smaller than that allowed by the "Sale of Gas Act."



The Meter has been critically tested, and most favourably reported upon by official Meter Inspectors in London and Birmingham.

W. PARKINSON and CO. have made arrangements for the manufacture of these Meters, both in tin and cast-iron cases, and for the alteration of old ones to this principle, which is confidently recommended as possessing every quality that can be desired by Gas Companies, Corporations, or Private Consumers.

COTTAGE LANE, CITY ROAD, LONDON, E.C.

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TO CORRESPONDENTS.

No notice can be taken of anonymous communications. Whatever is intended for insertion, must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

THE JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, OCTOBER 1, 1878.

Circular to Gas Companies.

THE Education of the future Gas Manager is, we are happy to see, attracting much attention, and there is every prospect that some result will follow an earnest discussion of the question. But we must not under-rate the difficulties which lie before us in this matter. They arise from two different causes. The first is the varied nature of the attainments which a Gas Manager is required to possess. He must, for instance, be an architect; then he must be a competent engineer; and, further, he ought to be a skilled chemist and sound physicist. It may be a question how far it would be possible to dissociate the functions of the constructor, as we may call him, and the gas maker and purifier. But we must take things as they are, and endeavour to find the means of bringing the Gas Manager up to the point of perfection which he is now expected to reach. It will be found very easy to institute examinations; but before a young man can be examined, he must be taught. And here arises the second difficulty alluded to above. To follow a long course of instruction requires time, and that means money. There are many Managers who have been able to pursue an extended course of study, and these naturally occupy superior positions, with large salaries; but the bulk, whose life prospects are incessant labour and scanty pay, have no inducement to devote much time to a course of instruction. On paper it is easy to sketch a scheme. Imagine Beckton with class-rooms, a lecture-hall, and a staff of professors, and the thing would be done; but where are the students to come from? A few would doubtless be found; but we fear not many. We must then fall back on the examination plan, and encourage self-tuition. We know that there are many men who spend their leisure hours in acquiring knowledge, and, if opportunities of distinction were offered, we have no doubt that the number of these would be largely increased. Let, then, the British Association of Gas Managers mature a scheme and set it in operation. Mr. Warner's ideas strike us as excellent. Let a class of Associates be formed, and from them, after examination, elect the Members. These, in time, would form a distinctive class, who might be considered to have acquired honours. A correspondent points out that the Society of Arts examinations at South Kensington offer an opportunity for students to acquire distinction for scientific knowledge; but we confess that we should prefer to see the British Association of Gas Managers undertake the duty of examining candidates. We share Mr. Warner's horror of mere book-men, and would rather have thoroughly practical investigation into a man's merits. The success of a Gas Manager depends to a great extent on an intimate knowledge of details, and this cannot be found in books, but must be learnt by experience. Here, for the moment, we leave the question, hoping that many of our readers will contribute to the discussion.

We have very little to add this week to the information we have already given respecting the electric light. Its invasion of our streets is apparently as far off as ever. It has been exhibited by a manufacturer in Sheffield, and naturally attracted a good deal of attention. It has also been exhibited at Ayr, and the Commissioners of that burgh are grandly talking of adopting it to illuminate the streets, so as to have their revenge on the Gas Company for their so-called exorbitant charges. We must wait to see what development the light will receive—which we can do with perfect equanimity. So far as we know at present, our two Metropolitan Authorities show no disposition to take any steps to promote the introduction of the light. They very properly leave it to private speculators, who will, we fancy, find some difficulty in raising capital.

The report of the Directors, and the accounts, of the Phœnix Gaslight and Coke Company have been issued, in anticipation of the half-yearly meeting to be held to-morrow. The net profit for the half year amounts to £49,593, which, after the payment of full dividends on all classes of stock, leaves a balance of £1543 to be carried forward—no great things, it may be said, but satisfactory, considering how the Phœnix Company are circumstanced. We are rather astonished to see that nothing is said about amalgamation in the report. The Directors, we have no doubt, have anxiously considered this matter, and we regard it as a misfortune for every one concerned that some satisfactory arrangement has not been come to between the Companies who are concerned. We do not wish to be prophets of evil; but the day will come when the Metropolitan gas undertakings will be absorbed—by what body it is now impossible to say. They should be wise in time, and consolidate their interests. "Union is strength." It would be improper to conclude this preliminary notice, to which much will probably have to be added, without congratulating the Company on the progress of their new works.

The accounts and report of the London Gaslight Company have also been issued, in anticipation of the meeting to-morrow. The profit for the half year amounts to £39,154, which, after the payment of all charges and full dividends, leaves a balance of £5456 to be carried forward. It has been arranged to send coals up to Nine Elms without transhipment—a step which should have been taken long ago, notwithstanding the interests of lightermen and others. The Company are now in a very favourable condition; but we may say once more that it is to the advantage of the Metropolitan Gas Companies to consolidate their interests. The London Company are much exposed to attacks on more sides than one, and it would be well for them to take a calm review of their situation, and decide for amalgamation.

The half-yearly report of the Alliance and Dublin Consumers Gas Company is before us, and we are again glad to note that the prosperity of the Company continues—we ought to say advances. Full dividends are once more paid, and the Directors make the satisfactory announcement that from the first of next year the price of gas will be reduced threepence per thousand cubic feet, in all but some insignificant outlying districts taking but small quantities. This will make the charge in the city of Dublin and the larger townships 4s. 3d. per thousand feet. The profit made during the past half

year has been £34,639; and, after payment of 10 per cent., which will absorb £29,500, there is left a balance of £5139 to be carried forward. The balances of previous half years bring up the floating capital of the Company to £20,403. This is all very well, but it is quite time the Directors commenced the formation of a reserve-fund. We feel satisfied that they are fully alive to the necessity of this step. Hard times are certain to recur within the next few years, and as much as can possibly be set aside should be used for the formation of a reserve-fund. It may not be found possible to go lower in price unless coals continue at cheap rates. We read with pleasure that the works of the Company are maintained in a high state of efficiency. No complaints from Dublin now reach us, and we hope that the Consumers are as well contented as the Shareholders must be.

The business of the Harrow District Gas Company steadily increases, and at a meeting held last Wednesday the Directors had the satisfaction to propose a dividend of six per cent., thus fulfilling a promise made in the original prospectus of the Company. Great things are not to be expected at Harrow for years to come; but the district of the Company is gradually filling up, and every year must bring a considerable access of business. If the affairs be well managed, the profits will necessarily be increased, and larger dividends may be anticipated in a few years. The Chairman of the Company is not disturbed at the apparition of the electric light, and has no reason to be. It will be a long time before the light reaches their limits.

The consumers of Margate may be congratulated on having the price of gas reduced to 3s. 6d. per thousand cubic feet. In the agitation which took place a year ago, we failed to find proof of any serious dissatisfaction with the Company, who have always done their best for their Customers. The reduction, however, will naturally strengthen the good feeling, between the Company and the Consumers, which we believe to prevail in the town. At the half-yearly meeting of the Company, recently held, a dividend of seven and a half per cent. was declared, leaving a substantial balance to be carried forward.

It is a great pity that Gas Suppliers and Local Authorities cannot continue on good terms. Gas Companies, we may take it as certain, know best the cost at which they can supply gas. It is of no use for a man to go into a butcher's shop, and when asked a shilling a pound for beef, to say, "I will only give you "ninepence;" but this is the style continually adopted by Local Authorities towards Gas Companies. A squabble of the kind at Hendon has resulted in the introduction of petroleum lamps, of which we are certain the Authority will soon get tired, notwithstanding the saving which is anticipated, and may be realized, but with many disadvantages. Clay Cross, too. The Local Board have fallen out with the Clay Cross Coal and Iron Company, who supply the place with gas, and the consequence is that the district is, and has been, in darkness since last Saturday. It is a miserable dispute about only a few shillings per lamp, and, as we have said, the producer knows more about the cost of production than the consumer. The man who could not agree with the butcher went without his dinner, and the Authorities who will not agree with the Gas Companies must go without their light.

The Exeter Corporation have not exactly settled with the Gas Company as to the terms on which their undertaking may be acquired. The question rests for the moment, to give the Corporation time to apply to Parliament next session for authority to make the purchase. In the meantime, the Company are hard up for money, and the Corporation are anxious that no further capital shall be issued without their knowledge and sanction. The proposition they make is that the affairs of the Company shall be carried on by a Committee of eight, four to be nominated by the Town Council and four by the Company, and that the Corporation shall make an immediate advance of £20,000, taking a debenture bond from the Company for security. This does not exactly suit the views of the Directors of the Company, who doubt their powers to issue debenture stock, and who, moreover, wish for a Board in which the Company would be in a majority. The quarrel, if we may so call it, is a very pretty one as it stands, and we hope the Parliamentary Committee of the Exeter Corporation, to whom the matter has been referred, will see their way out of the difficulty.

Further experiments have been made with Mr. Lane Fox's system for the simultaneous lighting and extinguishing of gas-lamps by electricity. The experiments are reported to have been very successful for some time past, but it is clear, from the fact that Pall Mall was one evening left in darkness, that accidents may happen to the delicate apparatus, so as to cause temporary inconvenience to the public. The invention is ingenious, and, we may say, so perfectible, that we may expect to see an extended application of it.

As we anticipated, an attempt is about to be made to rouse the Manchester gas consumer to a sense of his wrongs. It is proposed to make the price of gas a test question at the forthcoming municipal elections. There are people in the borough who are able to see that, at the present moment, the gas consumers pay rates for those who are better able to bear the burden. They have been made to do so for years, and the result has been that more than half a million of money has been paid over for public improvements in the shape of gas profits. If improvements are wanted in a city—and we do not say that Manchester did not require them—the proper course to pursue is to levy an improvement-rate, which falls proportionately on the shoulders of all owners and occupiers of property. A man may have property of large rateable value and be a small consumer of gas, and when gas profits are applied for public purposes he undoubtedly benefits at the expense of his neighbours who consume a large quantity of gas. Gas, we have repeatedly said, is far too dear in Manchester, and should be sold at the present time for 2s. or 2s. 3d. per thousand feet.

We have not noticed the vagaries of our friend the *Cambrian* for some time, but the accounts of the Manchester Corporation seem to have turned the head of the sober Welshman, who frantically calls upon the Corporation of Swansea to rush to Parliament for power to obtain a gas undertaking, from which large profits may be obtained to make Swansea a healthy and interesting place. The notion, we may take it, is to set up works to compete with the Company; but this, we can say once more, Parliament will never allow. The Corporation of Swansea may have the gas undertaking if they will pay a proper price for it, but we do not believe there is any desire in Swansea to effect the purchase; moreover, we feel perfectly satisfied that hard-headed Welshmen will never pay rates in the shape of gas profits.

The half-yearly meeting of the West of Scotland Association of Gas Managers was held at Kilmarnock last Thursday, under the presidency of Mr. Samuel Stewart, of Greenock, who delivered an interesting opening Address, dwelling chiefly on the electric light, and the obligation its appearance imposes on Gas Managers to do their utmost to cheapen the production of gas, in order that it may hold its own against the new illuminant. Subsequently valuable papers were read by Mr. W. Young, of Clippens, and Mr. W. Fairweather, of Barrhead, which, with the discussions that followed, will in due course appear in our columns. The company, after the meeting, visited the Corporation Gas-Works, and then spent a pleasant social evening.

Water and Sanitary Notes.

The Metropolitan Board of Works have taken seriously to heart the absurd statements published respecting the condition of the Thames at the time of the lamentable accident to the *Princess Alice*. The result will probably be that we shall have some inquiry into the state of the river at all times of the day, and the effect of the sewage on the river-bed. This latter is, to our minds, a more important question than the pollution of the water of the Thames by liquid sewage. It may be taken as a fact, we think, that all the statements respecting the fouling of the river with fœtid refuse are gross exaggerations. Undoubtedly it would be well, if it were possible, to keep sewage from the river, but in our case it is chimerical to dream of the possibility of keeping Metropolitan sewage out of the Thames. It might be carried further down the river at the expense of a threepenny rate, but against this all the Metropolis would protest. The chemical treatment of London sewage is, as we have said, impossible, and, if done, the residuum obtained would be perfectly valueless and cost a large sum to remove, its inevitable destination being the mouth of the river. Scott's sewage process is no less difficult of application; but supposing, for the moment, it was brought into use, no market could be found for the cement. It is amusing to see the Company, called into existence to work General Scott's patents, applying to the Authorities to find the means to enable them to make very large profits. Happily the Metropolitan Board have no funds which they can apply to experimental purposes. The Corporation of the City of London can give them no assistance, nor will the Thames Conservancy Board. If the Duke of Sutherland and Sir H. Cole, C.B., will find the necessary cash, the Metropolitan Board will allow them to take as much sewage as they may choose to experiment upon.

Major Bolton reports that during the month of August the Thames was in an excellent state, and the water taken from it of unexceptionable quality. The general healthiness of London is a conclusive proof that the inhabitants of the Metropolis do not suffer from drinking Thames water. Richmond, too—the

water supply of which is taken lower down the river, and, we fear, very imperfectly filtered—is just now extremely healthy. Major Bolton also reports that the water of the River Lea was in a good condition, and generally clear during the month. The severest of critics can, at the present time, find no fault with the Metropolitan water supply on the score of quality or of quantity. The Companies are doing their best, and we sincerely hope that we shall hear no more discontent. The one thing wanted is the supply at higher pressure, and this could only be given after a general amalgamation of interests, the advisability of which the Companies will do well to take into consideration.

Sanitary matters do not improve in Honiton, the Town Council of which are still opposed to carrying out any scheme for sewering their borough, and introducing an efficient and pure water supply. Typhoid fever is reported to have again broken out in the town, and it is, of course, ascribed to the water supply, which is obtained from shallow wells situated in the vicinity of nearly every house. As a matter of fact, Honiton is not worse off than a hundred other towns in England which have no sewers, and only a well water supply, but in which typhoid fever does not prevail. Now, however, the Local Government Board have acted on the authority they possess under the Public Health Act, and have issued a peremptory order that sewage and water-works shall be commenced within four months of the date of the order. This is the first instance in which the Board have exercised these powers. If the Honiton Town Council be recalcitrant, we shall see what further steps the Central Authority will take. The Council may be all they are represented, and all we have reported them to be; but it must be remembered that they have been elected by majorities, and if local self-government be worth anything, obedience must be paid to the will of these majorities. For the present, however, it may be said local self-government is suspended in Honiton.

The Exeter Corporation, having acquired the undertaking of the Water Company, are in somewhat of a fix. It will be remembered that while the Company were in existence they objected to the quality of the supply, which is drawn from the Exe, and, moreover, patronized, and even bought up, a scheme promoted to bring water from Dartmoor to their city, for which they have just paid a good round sum. They have had other schemes before them; yet, as we predicted they would, they have resolved to continue to take their supply from the same source as the Company. But the water of the Exe, before it reaches the intake, is polluted by the sewage of Tiverton and some other towns and villages. Under these circumstances the Corporation are desirous of taking action to compel the offending towns to keep their sewage out of the river. The process will be a long one, and for the next four or five years the inhabitants of Exeter will be compelled to drink water supposed to be contaminated by the sewage of Tiverton and other places. Meanwhile, Exeter itself is found to be an offender. The city pours its sewage into the Exe, and people below object to the nuisance. The Earl of Devon complains, in very mild terms, of the stench which pervades the shores of the river as it flows beside his park, and calls upon the city to abate the nuisance as soon as possible. It may be said to Exeter as was said to one of old, "First cast out the beam out of thine own eye, and then shalt "thou see clearly to cast out the mote out of thy brother's eye." However, Exeter will probably proceed against Tiverton, and if the Earl of Devon does not keep a firm hand upon the Corporation, Exeter sewage will still continue to flow into the River Exe.

New Companies Registered.—On the 10th ult., the New Twybridge Gas Consumers Company, Limited, was registered with a capital of £5000 in £5 shares, being formed for the purpose of acquiring and carrying on the business of the existing Twybridge Gas and Coke Company, Limited, county of Devonshire. The Shelf Water-Works Company, Limited, for supplying water to the inhabitants of Shelf, in the West Riding of York, was registered on the 11th ult., with a capital of £3000 in £1 shares.

Redhill Gas Company.—At an extraordinary general meeting of the Shareholders of this Company held last Tuesday, the Directors were authorized to borrow a sum not exceeding £1250, under the powers contained in the Redhill Gas Act, 1865, and the Companies Clauses Consolidation Act, 1845. The Chairman of the Company (Mr. W. B. Waterlow) stated that this additional capital was necessary to enable the Directors to provide for the rapid increase which had taken place in the business of the Company. The question of additional holder accommodation had been mentioned in the last three or four reports, and a favourable opportunity having offered for purchasing the land adjoining the gas-works, they had concluded a contract for its purhcase for £3000. There were eight cottages on the land, which would produce a good rental, or be available for the men employed on the works. Having decided upon acquiring the land, the next question was the manner in which to raise the money to pay for it, and as they were precluded by their Act of Parliament from borrowing more than £1250 until the whole of the share capital had been paid up, they had come to the conclusion to ask the Shareholders for power to borrow that sum, while they proposed to temporarily appropriate £1880, now invested in Consols, as a reserve or guarantee fund, and invest it in the land. They had thought it best to take this course, seeing they would shortly have to come to the Shareholders for capital for additional plant and other purposes.

GAS LEGISLATION FOR 1878.

(*Continued from p. 452.*)

The nine Acts which confer powers on Local Authorities to purchase gas undertakings are as follows:—

The *Bangor Local Board Act* authorizes the Local Board of Health for Bangor to acquire the undertaking of the Bangor Water and Gas Company. The expended share capital of the Company is £26,500, and they have borrowed on mortgage £4000, and, further than this, on "All Fools Day" this year they owed their bankers £2450. The consideration that is to be paid by the Local Board is first of all a lump sum of £2385; secondly, annuities to the amount of £2650, which is ten per cent. on the capital expended. These annuities may be redeemed at not more than twenty-five years purchase. The Manager, we are glad to see, is to be continued in office, or paid compensation for removal, the amount of which is to be determined by two eminent Engineers. The gas to be supplied by the Local Board is to have an illuminating power of fourteen sperm candles. For reasons which may be guessed, we note the fact that the Local Board obtained power to supply "fittings," . . . . "and other apparatus for or connected with gas-"works or with the supply of gas for public or private con-"sumption." The Local Board are empowered to borrow a sufficient sum to redeem the annuities and pay off all other capital charges.

The *Dalton-in-Furness District Local Board Act* authorizes the Dalton-in-Furness Local Board to acquire so much of the gas undertaking of the borough of Barrow-in-Furness as is concerned in the supply of the Board's district, and also to purchase the works of the Dalton Gas Company. The financial arrangements are somewhat complicated, and, as they are of purely local interest, we pass them over without further notice.

The *East Retford Borough Act* is to authorize the acquisition of the Retford Gas and Coke Company, Limited. The Company's capital is not stated in the Act, but the consideration to be paid is £24,000. The Company have been working under a Provisional Order obtained in 1874, and the price and quality of the gas continue as fixed by that Order.

The *Leicester Corporation Act* transfers the undertaking of the Leicester Gas Company to the Corporation of that borough. The terms on which the transfer has been effected have been referred to repeatedly in our columns; but we may here mention that the consideration to be paid to the Shareholders of the Gas Company is—"In respect of each C share, £20; in respect "of each B share, £21 8s. 7d.; in respect of each A share, "£32 17s. 2d." The annuities representing these prices may be redeemed at twenty-five years purchase, after six months notice; and the Corporation obtain power to raise a loan of £250,000 for the purposes of the gas undertaking, with certain small additions, which have to be paid off in the course of fifty-five years. The surplus profits of the undertaking, after providing for all charges, may be carried to the district-fund; but we sincerely hope that affairs will be so managed that gas consumers will not be subjected to any additional tax to be conveyed to the district-rate.

The *Limerick Corporation Gas Act* authorizes the Corporation of the City of the Violated Treaty to acquire and possess the undertaking of the Limerick Gas Company, which, until recently, was called the United General Gaslight Company. Unhappily, gas affairs in Limerick have, at different times, occupied a good deal of our space, and the past history of gas enterprise in that city need not here be further noticed. The consideration to be paid is £26,000 in cash, with sundry other small sums. Past experience of gas management by the Corporation of Limerick does not induce us to believe that benefit to the inhabitants will be derived from the transfer. Jobbery is triumphant in the Corporation, and the citizens will probably have to pay dearly for this acquisition. The Corporation by this Act obtain power to borrow £54,000. It is to be paid off in fifty-four years—or at the expiration of the Greek Kalends.

The *Newbury Borough Extension Act* authorizes the acquisition of the Borough of Newbury Gaslight and Coke Company's undertaking by the Newbury Corporation, and for other things. The land upon which the gas-works are erected is the property of the Corporation of Newbury, and held by the Company, under agreement, for a limited time, which expires this year. It was stipulated that, at the expiration of the tenure, the works were to be sold to the Corporation under a valuation, without reference to the business done. Accordingly, the transfer is to take place immediately, and, if no agreement be come to, the value of the undertaking will be settled by arbitration. The only indication we have of the supposed worth of the works will be found in the fact that the Corporation take power to borrow £25,000 for the purposes of the undertaking. The Corporation are to

supply fourteen-candle gas, and the price is not to exceed 5s. 6d. per thousand feet.

The *Newry Commissioners Gas Act* authorizes the Newry Commissioners to acquire the undertaking of the Newry Gas Consumers Company, Limited. The Company were embodied, under the Joint-Stock Companies Acts, in 1857, for the purpose of supplying gas to the town of Newry and its suburbs, in the counties of Down and Armagh. The consideration to be paid is £28,500 in cash, which the Commissioners hand over at once. But to obtain the money they will issue debenture stock at three several rates of interest—viz., four, four and a half, and five per cent. per annum, redeemable at different rates of purchase. The price of gas is limited to 7s. 6d. per thousand cubic feet; but, if the Commissioners charge only 5s., they have power to apply surplus profits to public improvements. The Commissioners obtain power to borrow £40,000 for the purposes of the Act—a sum which, we hope, will suffice for the perfect execution of all its provisions.

The *Stoke-upon-Trent and Fenton Gas Act* authorizes the Corporation of Stoke-upon-Trent and the Fenton Local Board to acquire the undertaking of the Stoke, Fenton, and Longton Gas Company. The paid-up capital of the Company is £34,000, and they have borrowed £350. The consideration to be paid by the Corporation for the undertaking is £85,000, leaving the Company their reserve-fund, which is £4000. The Corporation take power to borrow £110,000 for gas purposes. The quality of the gas is to be the same, and the price the Corporation may charge is not to exceed 5s. per thousand cubic feet.

The *Sutton-in-Ashfield Gas Act* empowers the Local Board of Sutton-in-Ashfield to acquire the undertaking of the Sutton-in-Ashfield Gaslight and Coke Company. This Company obtained a Provisional Order in 1874 which fixed their share capital at £10,000, of which £6500 has been paid up, and at the same time authorized the raising of £10,000 additional capital, none of which has been subscribed. The Company have a debenture debt of £4200. The consideration to be paid for the undertaking is £16,250, which is to be paid in a lump sum.

The four Acts giving Local Authorities additional powers with respect to their gas undertakings are as under :—

The *Burton-upon-Trent Improvement Act* authorizes the Commissioners to borrow £10,000, and such other sums as the Local Government Board shall sanction, for the construction and maintenance of additional gas-works and other purposes. There is nothing further in the Act which requires notice.

The *Hamilton Burgh Act* authorizes the Commissioners, among many other things, to add to and improve the gas-works supplying the burgh. The Commissioners acquired the undertaking of the Hamilton New Gaslight Company in 1846. Since that time the demand for gas has largely increased, and additional works are now required. By this Act the Commissioners obtain power to borrow £30,000, but it is not specified how much of this is to be devoted to gas purposes. The illuminating power of the gas to be supplied is to be sixteen candles, and the pressure is to be not less than six-tenths and eight-tenths of an inch within the usual hours.

The *Maryport Improvement Act* is to limit the price of gas supplied by the Trustees, which is not to exceed four shillings per thousand cubic feet, from which a discount of ten per cent. is to be allowed to consumers paying not less than £100 per annum who settle their accounts within fourteen days of application. The Act gives the Trustees the power to levy a gas-rate to supply any deficiency of revenue; but no such rate can be made while the charge for gas is less than the maximum fixed by the Act.

The *Nottingham Improvement Act* is to empower the Corporation of Nottingham to construct additional gas-works, and for this purpose to borrow to an indefinite amount with the sanction of the Local Government Board.

Dorking Gas Company.—At the half-yearly meeting of this Company, held last Tuesday, a dividend of 9 per cent. was declared, being £1 2s. 6d. per share on the shares class A, and 18s. per share on the shares class B. Messrs. Field, Butler, and Cannon were chosen Directors, the two latter being re-elected, and Mr. Fielder was re-elected as an auditor. A cordial vote of thanks was accorded to the Chairman and Directors, for their services to the Company during the past half year.

Fatal Accident at the Oldham Corporation Gas-Works.—Last Tuesday an accident, by which two men lost their lives, occurred at the Higginshaw works of the Oldham Corporation. A chimney there is nearly completed, all but the top part being finished. Two men, named George Livesey and Patrick O'Connor, were being wound up in a hoppet by means of a crane. They were inside the chimney, and when they were near the scaffolding at the top the rope broke, the men falling a distance of nearly 60 yards. An alarm was given, and when some men went into the chimney, Livesey and O'Connor were found dead, their bodies being fearfully mangled. The rope was thought to be quite safe, and only the day before the employer of the men, Mr. Thomas Whittaker, of Royton, went to the top of the chimney by means of it.

Correspondence.

[We do not hold ourselves responsible for the opinions expressed by Correspondents.]

THE EDUCATION OF THE GAS MANAGER OF THE FUTURE.

Sir,—Having read with much interest the letter written by "Isca," and published in the Journal for Sept. 17, I ask your permission to say a few words on the subject, from a manager's point of view. I have had many years experience in works making from 3 million to 20 million feet per annum, and to such establishments the application of my remarks is to be limited.

There is much tardiness, on the part of gas companies, in the adaptation of improved appliances for the manufacture and distribution of gas; the fact being that their sole object is to earn their highest legal dividend, and as soon as that goal is attained, they contentedly rest on their oars. The possibility of cheapening the cost of their speciality does not occur to them until they are roused by a consumers price-agitation. Gas companies, in this respect, are neglectful of their own interests, as well as those of their customers; it is not sufficient for them to earn a large dividend, they should leave no stone unturned to increase their business and improve their processes of manufacture and distribution.

The cause of this apathy is readily found. The ordinary board of directors, with whom the management of the company rests, comprises but one or two individuals who are fitted for their office by knowledge and experience, the remainder being selected, not on account of personal qualifications, but because they, and their connections, are the holders of a large number of shares. It is no uncommon thing to find a board constituted entirely of shopmen, well up in buying and selling, but utterly in the dark in regard to chemistry and engineering. The engagement of their manager hinges chiefly upon the matter of salary; they prefer a good accountant to a clever chemist or engineer, and are careful to stipulate that a large portion of his time shall be devoted to the books.

Every gas manager ought to possess the amount of scientific knowledge that will render him capable of forming a clear comprehension of the various processes under his superintendence, and of the natural laws by which they are governed; and in order to do this intelligently, he must have been through a course of chemistry and engineering, and also be fairly acquainted with natural philosophy and mathematics. Any person wishing to become or continue a gas-works manager, who feels that he is wanting in this respect, should commence at once to improve his knowledge.

As I have derived great advantage from philosophical experiments, I have for many years kept a quantity of apparatus at the works where I was employed, using a corner of the office for this purpose, if there was no other suitable place. On one occasion a director, poking and prying about, as rich but ignorant directors will do, chanced to light upon my cupboard of chemicals; he adjusted his glasses, and inspected its contents with an air of suspicious disdain. The subject was mooted at the next board meeting, and, so far as I could gather, the general opinion seemed to be that there was no harm in my having the apparatus on the works; but it was hoped that it would not occupy too much of my time, to the detriment of my regular employment. But, in spite of that and many other disparagements, I have always taken every opportunity to improve my knowledge on matters relating to my profession.

Let us suppose that a young man has studied for and obtained a certificate, according to the scheme proposed by "Isca." When he applies for a situation as Manager, would his certificate benefit him at all? And would the directors avail themselves of his services in preference to those of a "Frugal Stoker," backed up with satisfactory references? I never met with any indication, on the part of directors, of a desire that their manager should be well up in the theory of his profession, nor have I heard of any case in which the theoretical knowledge of the candidate had a favourable effect in determining his appointment. Candidates are not often required to state more than experience, age, references, and (last, but not least) salary required. If there was any demand for gas managers with fair scientific acquirements, a supply would soon arise to meet it.

Although unappreciated by employers, the fact remains that the "Theoretical Man," all other things being equal, is by far the better of the two. He discharges his duties with energy and method, takes an intelligent interest in any new appliance submitted to his care, and, being capable of grasping the inventor's ideas, works the apparatus in the most advantageous manner. The "Frugal Stoker," on the other hand, whose knowledge is confined to practical experience, is too ignorant to move out of his accustomed groove. There is as much difference between the two men, in the respective performance of their duties, as there is between a gentleman's valuable carriage horse and a cab-hack. The "Stoker" looks with disdain upon any new thing—unless there is a very obvious saving of labour or trouble on the face of it—he pockets his hands, props himself at an angle against the nearest doorway, wall, or post, and grumblingly expresses himself to the effect that "we are doing very well, and do not want nothing fresh."

If "Isca" can get directors to adopt his views, it will be better for gas managers and gas companies. The latter were never in a more flourishing state than at the present time, and, if managed with energy and discretion, there is no reason why they should not continue to prosper for many years to come. "Cum multis Aliis."

Sir,—The letter of your correspondent, "Isca," will doubtless be read with considerable gratification by many of your younger readers who, like myself, are striving for, and hoping, at some future day, to attain, the position of gas manager. Hitherto we have had to pursue our arduous studies unaided, and, apparently, unheeded; no word of counsel or advice has been vouchsafed us by any of the heads of the profession we are about to enter; the British Association of Gas Managers has rigorously excluded us from its meetings, and denied us its benefits; but, now that one friendly hand is held out to us, and one eloquent pen employed on our behalf, we shall take heart, and look for brighter and more prosperous days in store.

The recommendation that the Association constitute an Examining Board for candidates for qualification as gas managers is a wise suggestion; but the writer appears to forget that a similar function is performed by the Society of Arts, although its certificates do not carry the same authority as they would if given by the British Association of Gas Managers. If the Association could combine or co-operate with the Society of Arts, in its examination on this subject, I think it would be productive of good results, in educating the student, and giving him an accepted certificate of proficiency, and title to the position of gas manager, in the event of his success.

Much good might also be done by instituting a branch of the Association for younger members (not gas managers), giving them facilities for discussions, offering inducements for the competition of papers, and allowing other similar means of mutual instruction.

Hoping that some good will be the result of this discussion, I beg to subscribe myself

A STUDENT.

SIR,—A few letters have recently appeared in your JOURNAL, bearing on a most important subject — namely, the Education of the Gas Manager.

I am of opinion this is one of the subjects that cannot be too fully discussed. In these days of advancement, when every improvement is very shortly to be improved upon, when perfection is being eagerly sought after, it becomes our profession to see that it is keeping up with the times. That there is room for improvement, there can be no doubt; but how the improvement is to be effected is a question difficult to solve.

It seems to me the first step ought to be to convince gas managers generally that more skill and more energy are necessary for the carrying on intelligently of their work. No gas manager, nor any other manager, has arrived at perfection. There is something to learn everywhere, either to imitate or avoid.

And the gas manager has not to go far to learn. Let him pry into the why and the wherefore of everything, however small, inside his own works. In too many instances the coal is put into the retort, and allowed to remain there the prescribed time; but he is ignorant of what takes place. I venture to suggest that, in many instances, no part of the work is really understood. If such managers make up their minds to improve on this state of things—it will come very easy—let them begin a system of experimenting in every department, compare what they find with standard authorities, such as the recently-issued "Treatise on Coal Gas." This will open up a large field for inquiry, and the result will be a good one.

But, before a man can do all this, he must be possessed of what cannot be obtained from books—namely, ambition, energy, and aptitude; and I believe, Sir, a man may be a matriculated student at one of the Universities, and, without energy, he will leave even worse than he entered; and I also believe any man with ordinary capabilities, with energy, will make what is considered a first-class gas manager.

We admit that theoretical training is necessary; but it may be made too much of. If carried too far, it becomes ornamental, and, as such, is useless. If the rudiments of natural philosophy generally are acquired, this should prove sufficient for our purposes; but engineering, chemistry, drawing, and coal gas, its manufacture and distribution, are subjects that ought to be pursued with avidity.

In the previous letters on this subject reference is made to the "Frugal Stoker." Many men who were once frugal stokers are now gas managers, and as such perform their duties well and intelligently. From their experience of the practical part, combined with what I describe above as indispensable, they have fitted themselves for the position they now hold, and I say all credit is due to them.

George Stephenson was a practical man—a man once in a very humble way; but we all know to what eminence he rose; we know how his opinions are valued. Let us keep his noble example continually before us.

But how are we to know who are, and who are not, talented gas managers? It is only reasonable to expect, after a man has spent much time and earnest study in any profession, he should be anxious to obtain some opportunity of putting his acquirements to the test. I think the British Association of Gas Managers have the power and the influence to afford the opportunity. Mr. Warner suggests that a class of associates should be formed in connection with the Association, and that members should be elected from it. Now, I think, with Mr. Warner, this might help to raise the tone of the profession, but I do not think it would offer sufficient encouragement to deserving persons; there would be too much *form* about the scheme to have any practical effect.

I would suggest something like this—let the Annual Meeting of the Association extend a day longer than hitherto, let it be notified by circular to all the members that this day is for a competitive examination in matters relating to the profession; any members may take part in the examination.

Let, say, twelve gentlemen who are acknowledged to be authorities in gas matters put twenty questions, these to be answered by the students, in writing, without any assistance or notes; and, generally, the examination to be conducted in the same manner as is done in a University.

To the successful candidates, first, second, and third prizes might be awarded.

I think this would be a popular movement. It would give men who have no time to write an elaborate paper an opportunity of putting their talents to the test.

My suggestion may not be of much value; but, perhaps, when Mr. Bennett has several suggestions before him, he will be assisted in determining in what way the matter can be successfully taken up.

Gas-Works, Bury St. Edmund's, Sept. 27, 1878. JOHN M. M'CRAE.

THE COST OF COAL AND THE PRICE OF GAS.

SIR,—In your last publication, I observe that Mr. R. H. Jones takes exception to my statement, that "the prevailing belief that the selling price of gas is mainly dependent on the price of coal, is erroneous and mischievous."

When I made that observation, I had little idea that the belief was entertained by men so circumstanced as Mr. Jones; yet, not only does he confess to holding such an opinion, but, in trying to justify it, he has been good enough to offer a few figures which afford convincing proof that his contention is futile.

In the report quoted by Mr. Jones, I showed that whereas in Leeds coal, less residuals, costs but 6·25d., interest entails a charge of 10·25d. per 1000 feet. Surely, under such circumstances as these, coal cannot be considered as *mainly* answerable for the price of gas. Let us see how the case stands at Dover, judged by the figures produced by Mr. Jones. The average cost of coal for a period of three years, ending (I presume) 1872, was 8·8d., and over the next three years 15·3d. per 1000 feet. Here Mr. Jones's figures begin and end; and although, like him, I have had much to do with gas finances, I confess myself quite unable to discern how he sees in them a refutation of my proposition. There is a comparison between the prices of coal in two periods; but nothing whatever to show (what is really under discussion) the relation which coal bears to the selling price of gas.

The cost of coal in Leeds during the period referred to was about one-fifth of the price of gas. In Dover, during the period ending 1872, and at the present time, the same proportion will probably hold good. I will also hazard an opinion that the charge for interest now, and then, exceeds that for coal, less residuals.

How, then, comes Mr. Jones to dispute with me? I never said anything so preposterous as that the cost of coal did not influence the price of gas; but, on the contrary, distinctly anticipated a time when, all possible economies having been effected, the price of the latter must rise and fall directly with the former.

As to the cost of coal during a period of panic, I will only say that I think it would be wholly unwise, and not at all in accordance with sound commercial principles, to allow such exceptional and erratic data to influence a policy. True enough, once upon a time, the enhanced price of coal added 6d. per 1000 feet or thereabouts to the cost of gas in the holder; but 6d. over three years is but 2d. when spread over nine, and 1d. per 1000 feet put to reserve would afford ample protection against such an eventuality.

Mr. Jones cannot have read my report with care, or he would have seen that the substance of my argument is that, whatever the price of coal, there are many charges so elastic, and so entirely dependent on the *sale* of gas, that an extension of business under certain conditions—excluding that of lighting—bring with it an enormously accelerated profit. Charges for interest, leakage, maintenance of works and mains, salaries, inspection, stationery, &c., &c., are only constant with a constant sale of gas, and must shift in favour of the company and of the consumer with every increase in the sale that does not necessitate an extension of plant.

Mr. Jones further contends that "artificial heat is not required during summer." This is information. He also says that he has quite an array of gas-fires during the winter. Upon which I will only remark, that were he strictly economical it might be otherwise, at any rate with gas charged at 3s. 4d. per 1000 feet. There may be economy in this, but in trying to persuade customers in this direction I have dwelt upon the saving of time and labour, economy in relation to curtains, carpets, papers, &c.; but hitherto with singularly little result. Gas must be further cheapened before it can be said to compete with coal in a fire-grate, and it is with this object in view that I purpose catering to the million by placing an enduring advertisement in the form of a small gas-stove in every house, not looking to reap my whole profit out of the advertisements direct, but confidently expecting an increasing demand, as the economy and cleanliness of gas for heating and cooking become more and better understood.

Leeds, Sept. 26, 1878. HENRY WOODALL.

LEAKAGE OF GAS AT READING.

SIR,—Fearing that your remarks in the JOURNAL of Sept. 17, as to the loss by leakage of the Reading Company, may lead to a wrong inference being drawn, it is as well, perhaps, that I should state what the leakage actually is. The Company are being *paid for* considerably over 10,000 feet per ton of coal carbonized, and the loss by leakage is 6½ per cent. on the quantity made.

Reading Gas Company, Sept. 25, 1878. EDWARD BAKER, Engineer.

DR. WALLACE'S REPORT ON THE BEST MEANS FOR THE DEVELOPMENT OF LIGHT FROM DIFFERENT QUALITIES OF COAL GAS.

SIR,—With reference to the report presented to the British Association, "On the Best Means for the Development of Light from Coal Gas of Different Qualities," which appeared in the JOURNAL for Sept. 17, we think many of your readers will be curious to know why "Bray's bat's-wing" did not figure in the report. We therefore ask the favour of being allowed to explain.

We hold—and have manufactured in accordance with our opinions—that bat's-wings are not suitable for cannel gas, because the slits have to be made so fine that they very readily stop up; which stoppage the users will not, and in many instances do not know how to, remove. But, anyhow, the inconvenience of having it to do frequently is intolerable, to say nothing of the loss of light and smokiness produced by the splitting up of the flame. In the union jet these defects are reduced to a minimum, and for this reason we have always held, and now hold, that the union jet is the best burner for cannel gas; and, notwithstanding its supposed, and sometimes loudly proclaimed, inferiority as an illuminating instrument, its practical virtues entitle it to the first place amongst burners for cannel gas.

As to its supposed inferiority to the bat's-wing as an instrument for developing the illuminating power of cannel gas, the report, at all events, shows this to be a myth, as Bray's union jets gave the highest illuminating power of all the two to three score burners reported upon, and have the fewest defects, such as "smokes" and "blows," recorded against them.

We, however, notwithstanding our opinion as above expressed, and confirmed by the report—to please people who have a fancy for the article—decided, some time since, to manufacture bat's-wings for cannel

gas, and should have sent complete sets to Dr. Wallace for examination, had we been able to do so in time for his report.

Blackman Lane, Leeds, Sept. 21, 1878. GEORGE BRAY AND CO.

Legal Intelligence.

ST. ALBANS COUNTY COURT.—FRIDAY, SEPT. 20.

(*Before Mr.* JAMES WHIGHAM.)

THE POLLUTION OF THE RIVER VER.

The case of Mr. Charles Woollam, of the Abbey Silk Mills, against the Corporation of St. Albans, under the Public Health Act, 1875, in respect of the Pollution of the River Ver, by allowing sewage to flow into it, came on for hearing, it having been adjourned from the last Court-day to allow the defendants time to carry out a complete scheme of drainage which they then had in view, and which they have now decided to adopt.

Mr. ANNESLEY appeared on behalf of the Corporation, and applied for a further adjournment until March next, stating that a scheme by Mr. Roper, C.E., of Dudley, had been adopted by the Corporation, and that it was intended to issue the necessary parliamentary notices in November on the owners of land which the scheme would affect, and, further, that they would prepare a Bill in Parliament to sanction the extension of the municipal district which would be required for the purposes of the scheme.

Mr. DUMVILLE, on behalf of Mr. Woollam, objected to the adjournment, and urged that the defendants should be compelled to execute works, of which he gave an outline, which would clear part of the River Ver, and abate the nuisance so far as his client was concerned, by intercepting the four sewers between St. Michael's and the bottom of Hollywell Hill.

Mr. ANNESLEY contended that, as the district named was outside the city boundaries, they could not do this without first obtaining special powers, and even if they could, it would entail considerable additional expense on the city, and would necessitate a new scheme, different from Mr. Roper's, being prepared.

The JUDGE granted Mr. Annesley's application, and adjourned the further hearing of the case until March, 1879.

TORQUAY POLICE COURT.—MONDAY, SEPT. 16.

(*Before Mr.* W. BRIDGES, *Chairman, and Mr.* L. B. BOWRING.)

A DISPUTED GAS ACCOUNT.

Mr. *F. R. Carter*, solicitor, of Torquay, was summoned by the Torquay Gas Company to show cause why the sum of £10 8s. 9d., for gas consumed by him, from Jan. 5, 1877, to July 17, 1878, should not be recovered against him.

Mr. BAKER appeared for the Company; Mr. CARTER defended himself.

Mr. BAKER said the amount sought to be recovered was for gas supplied to defendant at his house, Ambleside, in the Teignmouth Road, from the 5th of January, 1877, to the 17th of May, 1878. The summons had been granted under the 23rd section of the Gas-Works Clauses Act, 1871, which stated that when money due for gas was not paid, the justices might issue a warrant of distress to recover the amount. He believed it was defendant's intention to raise questions as to the quantity and quality of the gas supplied; but he should show that the quality was good and the quantity sufficient. He might mention that the Company were liable to a fine of £10 if the quality of the gas was not up to the required standard. In this case he must say every effort had been made by the Company to come to an arrangement with defendant, but without success.

F. G. Hamer said he was a gas-fitter in the employ of the Company. His duty also was to go and take the indices of the meters in company with another man named Mabin. He read the state of the meter, and Mabin made the entry in a book from his reading. He took the indices of the meter at Ambleside, Teignmouth Road, and read them correctly to Mabin. He examined the meters twice every quarter—once for the purpose of supplying water to the meters and otherwise attending them, and once for the purpose of taking a record of the amount of gas consumed.

Cross-examined: In going to defendant's house, he had heard complaints about the gas. The defect arose from naphthaline being in the service; but, notwithstanding that, there would be a sufficient quantity of gas passing through the meter. The naphthaline would form in a round ball in the pipe, and, if left, close it up in time. He blew it out twice in eleven months. He heard there was a bad light, but the quality of the gas was very good, though the quantity was rather short. He only knew of a few complaints made about the gas. After blowing the pipe, he found there was a sufficient quantity of gas, but on going again it was just as bad as before.

W. Mabin, also in the employ of the Company, stated that he assisted in taking the gas-meter indices with the last witness. He inserted correctly everything that Hamer read to him. The index at Ambleside from Jan. 5, 1877, to March 31 of the same year, indicated 1200 feet; from the 3rd of March to the 3rd of July, 6500 feet; from the 10th of July to the 3rd of October, 7900 feet; from the 10th of October to the 3rd of January, 1878, 12,200 feet; from the 5th of January to the 2nd of April, 44,000; from the 2nd of April to the 17th of May, when the meter was taken from defendant's residence and brought to the gas office, the amount was 55,900 feet, which was the amount consumed from the 3rd of January, 1877, to the 17th of May, 1878, the value of which was £10 8s. 9d.

Mr. *E. Smith*, chemist, said he was employed by the Company to test the illuminating power of their gas. He tested it at various intervals, about a month apart, and did not tell the Company when he was going to do so. The gas had always been above the parliamentary standard, which was 14 candles. It had never been below 14 candles, and it was certainly a most excellent gas, and contained much less sulphur than that supplied by the London Companies. Naphthaline was present in all gases, and was liable to block up small pipes, but not a 2-inch pipe. It would also cause a diminution of light, sometimes to the extent of 25 per cent. Another cause of defective light was bad burners. In the defendant's case the poorness of the light was not owing to naphthaline, but to the foulness of the internal fittings.

Mr. *J. Little*, Surveyor to the Local Board, said it was part of his duty to attend to the public lamps and see they were all right. He knew the lamp, in the Teignmouth Road, near defendant's house; it gave a good light, and was an average of all the others in that district. He had seen the lamp at various times, evenings as well as by day, and had never heard any complaint respecting it.

Samuel Pike, a lamplighter, said he had lighted the district round Teignmouth Road. He had always found a good supply of gas there, and this lamp was no exception to the rule.

Mr. *J. Greenfield*, Manager of the Company, said he had a complaint from defendant on the 26th of November, 1876. He went to his house, and on examining the fittings he found no pressure. He only examined the fittings in the floor, as those in the ceiling he had no means of getting at. He told defendant at the time he thought it was in consequence of the fittings inside, and defendant then pointed to the outside lamps; they were burning no better than the inside. He (witness) afterwards examined the main, and found there was an abundance of pressure there. About eleven months after he heard from defendant again. He did not then go to his house, but sent a man with instructions that he was to examine the service-pipe, which, in the ordinary course of things in a private house, was a ¾-inch pipe. In Teignmouth Road a new 3-inch main had been laid down instead of the old 2-inch, in consequence of the increase of consumption. He knew the gas had always been of the proper quality, and the pressure sufficient. There had not been general complaints from the houses in the neighbourhood.

Cross-examined: He believed defendant's service-pipe was sufficient to supply the place. It was only because more calls were made for gas that the new main was put down.

J. Aldridge, a gas-fitter employed by the Company, said he went to defendant's house on the 20th of November, 1877, and found a little obstruction in the fittings, which he wired and blew out. He then laid down a 1-inch pipe in place of a ¾-inch pipe which was there previously. The pressure was very good. He met defendant soon after, and asked him if the gas was better, to which he replied that it was. On the 17th of May last he removed the meter from defendant's house, and when he did so he took the index, which showed a consumption of 55,900 feet.

Mr. *J. J. Matthews*, Accountant to the Company, produced a book showing that the last money paid by defendant was on Feb. 21, 1877, and they had received nothing from him since.

This concluded the Company's case.

Mr. CARTER said he considered that this case was one of goods bought and sold; the Company provided gas, people bought it, and a meter was used to measure the supply. The usual mode of recovery was in the County Court, but an Act of Parliament had given special power to their worships in dealing with this matter. In a case like this, however, he would point out that proceedings must be taken within six months of the demand being made for the money. He should also contend that the gas supplied to him was of a bad quality. He had frequently told Mr. Gardner so, and that he should not pay for it; he further told him to take away the meter, as he was obliged to use lamps. The Company had agreed to supply him with gas at a certain price, and of a standard provided by Act of Parliament, for so much per foot. He had agreed to that, but when the article turned out to be not what he contracted for, when there was not sufficient pressure to give light in his house without using lamps, and that continued not for a week, or month, but for years, the contract was broken. If the Company attended to the service-pipes the supply would be good for three or four nights, and then be as bad as ever. He contended the Company could not claim the amount, as the words of the Act were, "Any person supplied with gas." They would have to show that the thing supplied was really gas, and, unless they kept their contract, would be unable to move in the matter. The witnesses for the prosecution had admitted that there was a want of pressure, and he should call his servants, who would prove that they never could see in the kitchen when the gas was lighted, and that they were obliged to burn candles to read by.

Mr. BRIDGES: I do not think that will be a means of defence in this matter. There is no doubt the Company can proceed under this 23rd clause, and, according to the clause, you come under the definition of a "person who has been supplied with gas."

Mr. CARTER: Pardon me, *proper* gas.

Mr. BRIDGES: No; the words are "supplied with gas." Unless you can show sufficient cause to the contrary, we must make the order.

Mr. CARTER: I am addressing you on the point that the gas shall be of a certain quality.

Mr. BRIDGES: I do not think that is the issue involved.

Mr. CARTER: If they supply me with gas that will not burn, I do not see the benefit of the Act of Parliament. They agreed to supply me with gas of a sufficient standard, for which I agreed to pay.

Mr. BRIDGES: That would be your argument in the County Court.

Mr. CARTER: I will put it to you whether the article supplied was gas.

Mr. BRIDGES: I am not here to answer that question.

Mr. CARTER: I say the gas was not sufficient for the purposes of my servants, and they will tell you so, and that they were always obliged to use lamps to read and write by. You will hear further, that when the gas was lighted there was a rush of foul air from the pipe, and after a few minutes the light would settle down into a sort of glimmer.

Mr. BOWRING: You were not obliged to use the gas.

Mr. CARTER said he would now call his witnesses.

Mr. BRIDGES: You can call your witnesses, but it is my impression, as well as my brother magistrate's, that you have lost your case. If you were displeased with the gas, and had moved in the matter, and proved your complaints were well founded, the Company were liable to a fine of £20. You did not do that, but you went on to use the gas.

Mr. CARTER: I say the gas was not enough for my purpose, and in law I have shown you a sufficient cause why I refused to pay. I am not bound to sue the Company; I rest upon my rights.

Mr. BOWRING: It would have been a more satisfactory proceeding than to use the gas and refuse to pay for it.

Mr. CARTER: What I say is this, that the quantity of gas supplied to my house was not sufficient for my purpose. I apply for a case on that point.

Two of defendant's domestic servants were then called, and gave evidence to the effect that they could never get light enough from the burner in the kitchen to do their work by, and were always obliged to use lamps and candles to read by. The same defect was also visible they said in the other rooms of the house.

The *defendant* went into the witness-box, and stated that he had made many complaints to Mr. Gardner, who he thought was the active representative of the Company. He had spoken to him at least 20 times, and Mr. Gardner had promised to have it rectified. His complaint was that the Company had not supplied him with sufficient gas to enable him to read or write, or his servants to do their work by, and as a consequence they were obliged to use candles and lamps. On two occasions the Company had sent up people to look at the pipes; then the gas had burned better for a few days, and after that was as bad as before. The Company had recently laid down a new main in Teignmouth Road, and for the short time he was supplied from it the gas was very good. That was about three weeks before the meter was removed. This was a clear proof to his mind that the old pipe was not sufficient. The gas-fittings in his house were worth £25, but they were now rendered perfectly valueless, and he should claim damages from the Company in consequence, as they had broken the contract.

Mr. BAKER: You used about 14,000 feet of gas during the first quarter of 1877?

Witness: Yes.

Why was that used if the gas would not burn in your house?—In all the rooms gas was used as an aid to the lamps.

Then you had some benefit from it?—We had.

You complained in October?—I complained every month. Whenever I saw Mr. Gardner I complained to him.

Have not your complaints always been attended to?—No.

Did you on one occasion accompany Mr. Greenfield outside your house?

—I have no recollection of that, but I have heard him say that the defective supply was from want of pressure.

You have some fittings in your house which you had years ago?—Yes.

There has been no alteration in your fittings?—No.

There have been new burners?—Yes; I bought some new burners from a travelling man who came round, and they were very good.

Tell me what complaints you made between November, 1877, and May, 1878?—I told Mr. Gardner my gas was not good, and constantly told him I would not pay for it. I say constantly, but I cannot tell when I saw him.

Witness then read the correspondence that had passed between him and the Secretary of the Company (Mr. Kitson) on the matter, the general tenor of which was, that Mr. Kitson wanted the account settled, and defendant refused to pay.

Mr. BRIDGES said he was still in a difficulty with regard to the question of six months. It appeared to him that the Company could only claim six months.

Mr. BAKER: The words of Jervis's Act are, "Proceedings shall be taken within six months from the time that the matter of such complaint arises." The time of the demand in this case is from the 14th of May, 1878. I would submit that this is the same as in the case of poor-rates, in which, although the rate has been made more than six months before proceedings are taken, it has been decided that the six months run from the period when the demand has been made for payment.

Mr. BRIDGES: Do not the gas bills say, "This money must be paid within 14 days?"

Mr. BAKER: I have one here; it says, "If the account be not paid to the collector, it is requested that the amount be sent to the office within seven days."

Mr. BRIDGES: I think we shall have to give judgment which may be unsatisfactory to both parties. We can only give judgment for the last six months, which will be £2 12s. 11d.

Mr. BAKER applied for the costs of the day, which were granted.

LEEDS POLICE COURT.—TUESDAY, SEPT. 24.

(*Before Messrs.* LUCCOCK *and* CLIFF.)

WRONGFUL USE OF CORPORATION WATER.

Mr. *Samuel Wolfe*, who carries on business in Briggate, Leeds, as a looking-glass manufacturer, and also as a manufacturer of lead piping, was charged, on the information of the Chief Inspector of the Water-Works Committee (Mr. Geo. Wood), with an offence under the 43rd section of the Leeds Water-Works Act, 1867, which states that every person who, having agreed to be supplied with water by the Corporation, wrongfully takes or uses any water from any reservoir, watercourse, or pipe for any purpose other than the purpose for which he so agreed to be supplied, shall for every such offence forfeit to the Corporation any sum not exceeding £10.

The TOWN CLERK prosecuted, and Mr. GRANGER appeared for the defendant.

The TOWN CLERK stated that defendant had an arrangement with the Corporation that he should have water for drinking and cleaning, in the lock-up shop which he occupied, at £1 a year. They had found, however, that, instead of simply using water for those purposes, he had for the last 3½ years been using it for manufacturing purposes—namely, for the manufacture of lead piping. He need not state that much more would be consumed in that way than would be consumed under the agreement. The defendant's steam-engine had also been constantly supplied with water from the tap. This was a very bad case. The defendant had been convicted before, and fined £10 and costs, and he must again press for the full amount of fine.

Mr. GRANGER said that, as defendant would plead guilty and submit to the full amount of the fine, there was no necessity for going any further into the case. The water was used for cleaning the boiler out, and the man who so used it having been discharged, went and told of it. The defendant promised that it should never occur again.

A fine of £10 and costs was then imposed.

Miscellaneous News.

METROPOLIS WATER SUPPLY.

Major Bolton reports that the state of the water in the Thames at Hampton, Molesey, and Sunbury (where the intakes of the West Middlesex, Grand Junction, Southwark and Vauxhall, Lambeth, Chelsea, and East London Companies are situated), was in a good condition, and clear during the whole of the month of August, except from the 26th to the 28th, when it was indifferent, being turbid after the heavy rains. The highest flood state of the river at Molesey and Hampton during the month was 1 foot 3 inches above summer level, and the lowest 3 inches below the summer level. The intake of the Chelsea Company at Molesey was closed from the 4th to the 15th inst., during which time the supply was drawn from the impounding reservoirs. The rainfall, as taken at the Chelsea works, was 8·29 inches in August. The water in the River Lea was also in good condition, and generally clear during the month.

THE PURCHASE OF THE EXETER GAS-WORKS BY THE TOWN COUNCIL.

At a Meeting of the Exeter Town Council last Wednesday, it was reported that the Parliamentary Committee met on the 18th ult., when the Town Clerk brought up the draft agreement which he had submitted to Messrs. Daw and Son, the Solicitors of the Gas Company, and which those gentlemen had returned with considerable alteration; and he also produced correspondence which had passed between him and Messrs. Daw on the subject. The Committee resolved to ask the Company to permit the settlement of the purchase to be postponed for twelve months, in order to afford the Corporation time to apply to Parliament for an Act to authorize their acquisition of the undertaking; also to suggest that, pending such completion, the business of the Company should be carried on by a joint Board of eight members, four to be nominated by the Directors, and four by the Town Council, and that such joint Board be unfettered, except in regard to the raising of money; further, that the Council should lend the Company £20,000, to be secured by the debenture of the Company for that amount, payable one year after date, with interest thereon at 5 per cent.

The TOWN CLERK said that he had, in effect, communicated these resolutions to Messrs. Daw and Son, and had received in reply a letter containing the following resolutions passed by the Directors of the Company:—"Resolved, that whilst agreeing in the principle that, on an agreement for the sale of the Gas Company's works and undertaking, the Town Council should have sufficient time to apply to Parliament for the necessary powers, and in the meantime that the Town Council should have a control in the management of the undertaking, yet the Directors do not see how there could be a joint Board appointed partly by the Company and partly by the Town Council. The Directors think that the Town Council should be represented at the Board by three Town Councillors, and that if the latter object to any expenditure for additional works or otherwise, except in the usual way of conducting the business, the approval of an engineer, to be determined on, should be obtained before such expenditure be made. With regard to the proposal for a loan of £20,000 on a debenture at 5 per cent., the Directors draw the attention of the Town Council to the fact that the Company have no power to issue such a debenture."—"Resolved, that the Town Council be informed that the Directors are ready to meet a Committee of the Town Council to arrange for a sale of the works to the Town Council on terms based on the heads of agreement of the 25th of June, 1878, and with such extension of time and other consequent arrangements as may be found legally necessary. That the Solicitors be instructed to communicate these resolutions to the Town Council, and to urge on them the necessity of a speedy arrangement, as the Company must take immediate steps for raising funds."

On the motion of Mr. S. PEARSE the letter was referred to the Parliamentary Committee, to consider and report.

HARROW DISTRICT GAS COMPANY.

The Half-Yearly Meeting of this Company was held at the Guildhall Tavern, London, on Wednesday last—JAMES GLAISHER, Esq., F.R.S., in the chair.

The SECRETARY (Mr. J. L. Chapman, A. Inst. C. E.) read the notice convening the meeting, and the following report was taken as read:—

The Directors, in again presenting the accounts to the Shareholders, have the pleasure to report a continued improvement in the position of the Company.

The increase in the rental for the half year under review, as compared with the corresponding period of last year, is £160. The value of the residuals remains at about the same.

The continued increase in the business of the Company makes it necessary to ask the sanction of the Proprietors to the issue of £5000 of additional capital, in £10 seven per cent. shares, in such manner and at such time as the Directors may deem best.

The balance of the profit and loss account is £1124 17s. 9d. The Directors recommend that a dividend at the rate of 6 per cent. per annum (free of income-tax) be paid, and that £200 be written off the parliamentary expenses, leaving a balance of £24 17s. 9d. to be carried forward to the next account.

Dr. *Revenue Account, for the Half Year ended June 30, 1878.* Cr.

Manufacture of gas—				Sale of gas—		
Coals, including all expenses	£1135	11	6	Lady-day quarter—		
Purifying materials, water, oil, &c.	37	11	2	Private rental—		
Salary of Engineer	100	0	0	5,148,100 cubic feet at 6s.	£1544	8	11
Wages and gratuities	217	13	11	619,300 cubic feet at 6s. 3d.	193	10	8
Works, machines, and apparatus—maintenance of, repairs, and labour	113	5	0	Public rental and under contracts	190	3	6
Distribution of gas—				Midsummer quarter—			
Mains and service-pipes, repairs, maintenance, renewal, and labour	54	8	11	Private rental—			
Meters, renewing, repairing, and refixing	9	19	10	2,405,900 cubic feet at 6s.	721	15	10
Public lamps—				275,800 cubic feet at 6s. 3d.	86	3	8
Lighting	24	4	6	Public rental and under contracts	59	17	0
Rents, rates, and taxes—				Meter-rental, half year	74	15	6
Rents	16	14	0	Residual products—			
Rates and taxes	68	9	8	Coke, less labour and cartage	338	6	9
Management—				Tar	56	3	2
Directors and Auditors allowances	110	10	0	Liquor	45	18	1
Salary of Secretary	25	0	0	Transfer fees	0	8	6
Collector's commission	30	0	0				
Stationery and printing	17	1	10				
General establishment charges	82	1	8				
Sundries—							
Bad debts	12	8	9				
Total expenditure	£2055	0	9				
Balance carried to profit and loss account	1256	10	10				
	£3311	11	7		£3311	11	7

The CHAIRMAN, in moving the adoption of the report, said: Gentlemen, I shall only make a very few remarks on the present occasion. The first paragraph in the report speaks of a continued improvement in the position of the Company, and that will, I am sure, convey to your minds a great deal, because this has been a phrase we have been enabled to use for a good many of our meetings. The improvement has been continued slowly, I will admit, but there is a good prospect of it still continuing. We were a little disappointed at first with our dividends, and perhaps there were none more disappointed than the Directors themselves; for, being in a position of trust, it would have been a pleasing thing for us to be able to say that we redeemed the terms of the prospectus. To-day we are in that position, and I shall certainly sit in this chair with more comfort than hitherto, seeing that we have now redeemed our engagements. I am sure, therefore, the first paragraph of the report will meet with your approbation. The second speaks of the increase of the rental, as showing the slow improvement; but still, we are moving in the right direction. We are, none of us, above the business of gas-making; and we are so completely in it that we have a great jealousy with respect to the character of the article we supply. So great, indeed, is it that three or four times the testings have been sent to me, and I can almost tell the illuminating power, and it is one with which, if I brought all the figures before you now, nearly every one of you would be satisfied. You might say, "If you had not made the gas quite so good, you might have made a little more;" but we want to supply such an article that no master in the Harrow School shall have cause for complaint, and that fact is an exceedingly satisfactory one to me. The next thing I should like to make a few observations upon is in reference to the electric light. Electricity has always been a matter of considerable interest to myself, as regards its applicability to the wants of man; and at the present time my attention is particularly directed to it as applied to the lighting of large spaces. I believe it is very applicable to that purpose if it can be produced cheap enough. The question is: Is it possible to introduce the electric light at such a cost that we are not paying too much for it? In Paris, you all know, gas is sold at a high price, and so far as I have been able to collect information, the electric light costs a good deal more. At the present moment there are four carbon candles in each lamp, and it is a question to my mind whether, throughout the whole of the coming winter, when the nights will be so long, the electric light will be continued in Paris. Take those they even now have in Paris. Only two lights can be placed on each wire, as if there is a third or fourth light the wire is fused, and all of them are put out. I believe there are three or four engines at work; and if gas is used for the heating power, more would be required than would be necessary if used for lighting. But then comes this question: Mr. Sugg has improved gas-burners so as to make bad gas give a good light. He has produced a burner giving an illuminating power of almost 300 candles, and this will rival in brightness that of the electric light. It is a diffused light, pleasant to the eye, and not painful to look at, so that it may happen that if all our large spaces are to be lighted, it will be by gas, and not by electricity, and yet it will be equally beautiful. Viewing it in every way, I will not part with a single gas share I possess. It is a pleasure to think that things have been going

well with our Company, and that we are getting 6 per cent. dividends. I do not feel at all depressed, and I do not think the value of the shares will be depreciated, except for a little time. I believe that we, in the north of London, are safe for many years. With these few remarks I beg to move that the report be received, adopted, and entered on the minutes.

Mr. JOHN CHAPMAN (Deputy-Chairman) seconded the motion. He said he thought the locality in which the Company's works were situated was an improving one. Since last year it had been thoroughly decided by the Metropolitan Company to carry out the line of railway from St. John's Wood to Harrow; and during last week the surveyors had been down, in order to decide the actual route to the station, which was to be just below Harrow Hill. There would also be a fine new road from Harrow, which would obviate the danger of breaking the necks of the people as they went down the steep hill, and this was looked forward to as being of very great benefit to the town. At present, no doubt, the aspect of affairs was more encouraging than it had been ever since the Company had commenced operations. He did not know of one Shareholder in the Company who contemplated parting with a share because of the electric light, and he trusted that this would be the resolution of every Shareholder in the Company.

The motion was put and carried.

The CHAIRMAN proposed—"That a dividend at the rate of 6 per cent. per annum be now declared, and paid free of income-tax, and that £200 be written off the parliamentary expenses."

Mr. KILSBY seconded the motion, which was unanimously agreed to.

The meeting was then made special, for the purpose of authorizing the Directors to issue £5000 of additional capital, in pursuance of the Act of Incorporation, and in such manner and at such time as they shall deem best."

The CHAIRMAN said that it had been found necessary to have a little more capital in hand for use. It would be a great blessing to the Company if a new station were formed, because the coals could be carried much cheaper. Mr. Chapman had spoken somewhat strongly as to the absolute certainty of its coming, and, should it come, the business of the Company would increase so rapidly as to necessitate an application for a second £5000, but not until the first £5000 had been very economically used. It would be called up as their wants arose. He moved—"That the original and share capital having been expended, and being insufficient for the purposes of the Company, the further sum of £5000 be raised by the creation of new ordinary 7 per cent. shares of £10 each, to be issued at such times, and in such manner, and payable at such times as the Directors may from time to time, in the interests of the Company, think expedient." The Act of Parliament stated that, in addition to the original capital of £30,000, "the Company may, from time to time, raise such further sum or sums of additional capital as they may think proper, not exceeding £15,000 in the whole, by the creation of new ordinary or new preference shares of £10 each;" and the next clause stated that "the Company shall not, in any one year, make out of their profits any larger dividend on the additional share capital of £15,000, to be raised under the powers of this Act, than £7 in respect of every £100." The wording of the motion was therefore in accordance with the Act of Parliament; he would therefore beg to move it.

Mr. BAYNES said he seconded the motion because he believed it to be a measure founded on good sound common sense. The Directors had constantly, in the interest of the Company, to effect loans, sometimes at a very considerable rate of discount; but as a portion of this money was required for the working capital of the Company, it was considered better to place the money in the hands of the Shareholders, and pay them rather than the bankers. Of course the money would only be called up as it was absolutely required, so that no capital would remain unoccupied or unused. The proposed resolution had been under the consideration of the Directors for six months, and he hoped it would meet with the unanimous support of the Shareholders.

Mr. G. RANDALL asked whether there was not last session a Government Bill for raising additional capital.

The CHAIRMAN said that there was not; the Company had the right in themselves. If in future years they went to Parliament, no doubt auction clauses would be placed upon them; but if the concern was worked well, and they had a fair initial price, it would be to their advantage.

Mr. RANDALL inquired what the Directors proposed to do with the £5000. Were they going to pay Mr. Chapman's debt off?

The CHAIRMAN replied that, in reality, there was no debt to Mr. Chapman. On one side of the balance-sheet it would be found that £7000 had been borrowed, and it might be viewed as £500 of that; but still, if they did not have that, there would be £7500 on the other side.

Mr. BAYNES said he did not wish Mr. Randall to suppose that although authority was asked for raising £5000, that necessarily the whole of the amount was to be called up and expended. It was a prospective measure.

Mr. RANDALL: At what price?

The CHAIRMAN: We cannot fix a price; it is fixed by Act of Parliament. The shares will be allotted *pro ratâ*.

Mr. HORSLEY, C.E., as Chairman of the Finance Committee, explained that the loan should have been issued some time ago, and some of the Shareholders had asked: "Why not pay Mr. Chapman, and have the proper capital?" He had been for some time asking the Board for a little more money, as there was no money to work with. There had not been enough capital to admit of the Company paying their debts promptly. It was also proposed to make certain improvements at the works. One gentleman had said that the receipts from the sale of the tar were very small; and he (Mr. Horsley) admitted it; but the Company made the best of it they could. They were a long way from people who took tar, and consequently they could not get the same price as some of the large companies. To make the proposed improvements it was necessary that they should have more capital.

The motion was then put and carried.

Mr. BAYNES moved a vote of thanks to the Resident Engineer and Secretary (Mr. James L. Chapman). He said the dividend had now reached the point of 6 per cent., and this result was very much due to the care, diligence, and scientific skill that the Engineer had all along manifested. He had always held it to be of advantage that, when shareholders had good servants and faithful representatives, they ought to recognize their ability. Speaking for himself and co-directors, they recognized in Mr. Chapman a very diligent, faithful, and efficient servant.

The CHAIRMAN seconded the motion. In doing so, he observed that the position of the manager of gas-works was one that was becoming day by day more critical. It was essential now that, if he held his own, he should make himself acquainted with almost every subject in science, and have within himself a power of adaptability, in order to take advantage of and have the benefit of every improvement; and he felt certain that, if Mr. Chapman would still apply himself to the increase of his knowledge in the various directions that the manager of a gas company was bound to do, even if the electric light should come, having the longest end of the lever, he would turn it to the company's advantage. He was aware that Mr. Chapman had carefully prepared plans for the sulphate of ammonia works, and was keeping ahead of the times. He had, therefore, much pleasure in seconding the motion.

The motion was carried unanimously.

Mr. JAMES L. CHAPMAN, in returning thanks for the compliment paid him, said he was pleased that his services had been appreciated. The payment of 6 per cent. showed that the Company were in a progressive condition, and he was glad to think that affairs looked more prosperous than ever. He should endeavour to do his best in the future, and hoped the time would soon arrive when they would be paying 10 per cent.

Mr. RANDALL proposed a vote of thanks to the Chairman and Directors for the satisfactory manner in which the business of the Company had been conducted.

The CHAIRMAN, in responding, said that the officers were at one with the Directors—in fact, there was a unity of action and earnest attention to their duties on the part of every one. The Directors were also much indebted to the Auditors, who by their signatures bore testimony that everything was right and straight, and to these gentlemen and the Officers of the Company he begged to move a vote of thanks.

Mr. JOHN CHAPMAN seconded the motion, which was heartily carried.

Mr. JAMES RANDALL (one of the Auditors), in reply, spoke to the efficient manner in which the accounts were kept, and the sound state of the affairs of the Company.

The proceedings then terminated.

TOTTENHAM AND EDMONTON GAS COMPANY.

The Half-Yearly Meeting of this Company was held on Saturday last, the 28th ult., when the following report was presented:—

The Directors have pleasure in reporting that the result of the half year's operations is satisfactory.

The accounts now presented for the half year ended Midsummer last are prepared in accordance with the prescribed form of the Company's Act of Incorporation.

The demand for gas continues to show a satisfactory increase, and the Engineer reports that, in order to keep pace with the increasing requirements, it will be necessary to extend many of the trunk mains, and to substitute larger ones in the place of some of those now laid.

The balance to the credit of profit and loss account is £4245 11s. 3d., from which the Directors recommend that a dividend be declared at the rate of 10 per cent. on the original capital, and 7 per cent. on the new ordinary capital, amounting together to £3307 3s. 9d., leaving a balance of £938 7s. 6d. to be carried forward.

At this meeting two Directors retire by rotation—namely, Messrs. George Gripper and James Brickwell, and an Auditor, Mr. Alexander Nicol, all of whom, being eligible, offer themselves for re-election.

DR.—*Revenue Account, for the Half Year ended June* 30, 1878.

To Manufacture of gas—			
Coals, including carriage, unloading, &c., on works	£5323 3 6		
Purifying material, oil, and sundries at works	147 0 9		
Salary of Engineer	175 0 0		
Wages and gratuities at works	1051 5 3		
Repairs and maintenance of works and plant, including renewal of retorts, apparatus, tools, material, and labour	1124 0 1		
	£7820 9 7		
Less old material sold	77 2 6		
		£7743 7 1	
Distribution—			
Salaries of Inspectors and Clerk	£143 0 0		
Repairs and maintenance of mains and service-pipes, including material and labour	163 7 2		
Repairing, renewing, and refixing meters	141 16 1		
		448 3 3	
Public lamps—			
Lighting and repairs		254 7 2	
Rents, rates, and taxes—			
Rents of siding	£27 10 0		
Rates and taxes	502 9 8		
		529 19 8	
Management—			
Directors allowances	£375 0 0		
Salaries—Secretary and Clerks	226 5 0		
Collector's commission	254 11 1		
Stationery and printing	41 14 11		
General establishment charges and incidentals	193 9 9		
		1,091 0 9	
Auditors		35 0 0	
Bad debts		66 8 5	
Total expenditure		£10,168 6 4	
Balance carried to profit and loss account		4,207 5 3	
		£14,375 11 7	

CR.—*Revenue Account.*

By Sale of gas—			
47,116,600 cubic feet, at 4s. 3d. per 1000, less discounts	£10,007 6 7		
Public lighting and under contract	1,236 9 3		
	£11,243 15 10		
Rental of meters	395 18 11		
		£11,639 14 9	
Residual products—			
Coke, less £185 7s. 2d., labour and cartage	£1530 2 10		
Breeze	65 8 8		
Tar	526 14 6		
Ammonia and liquor, less £126 7s. 2d. for acid	601 13 4		
		2,723 19 4	
Lamp columns and fittings		10 0 0	
Transfer fees		1 17 6	
		£14,375 11 7	

DOVER GAS COMPANY.

The Half-Yearly General Meeting of this Company was held on Tuesday, the 3rd ult.—W. R. MOWLL, Esq., in the chair.

The SECRETARY (Mr. G. Fielding) having read the notice convening the meeting, the following Directors report and accounts were presented:—

We have the pleasure of again laying before you satisfactory accounts for the past half year; for, owing to the increase in consumption, and the remarkably favourable circumstances attending purchase of coals, freights, and other details of manufacture, the balance of profit bears a very fair comparison with that of previous half years, notwithstanding the substantial reduction we made in the price of gas, on the 1st of January last, both for the public lamps and to private consumers.

We accordingly recommend the payment of the usual dividend, for the past half year, of £3 15s. per cent., and also of the arrears of dividend which accrued in the years 1860 and 1861, upon the stock and shares then existing.

The erection of the gasholder in Trevanion Street has had a very beneficial effect upon the supply of gas to the town district, but we believe that we can secure still greater advantages in our manufacture and distribution if the gasholder space at Buckland is increased, and as such enlargement will become imperative in a short time if the progressive increase in our consumption continues, this subject is now engaging our attention.

We have given notice of repayment of our debentures, with a view to reduce the annual interest thereon, which has hitherto stood at 5 per cent. The amount has been taken up again at 4 per cent., with the exception of a small sum, for the advance of which we shall be glad to receive offers from the Shareholders.

Messrs. T. W. Fry and Edward Bottle retire from office as Directors, and Mr. Henry Hayward as Auditor, but all are eligible for re-election.

Dr. *Profit and Loss Account for the Half Year ending June 30, 1878.* Cr.

Coals	£4,720	7	3	Sale of gas, less discounts and bad debts	£9,245	8 9
Purifying	113	10	3	Coke, tar, and other residuals	2,593	2 9
Repairs and maintenance of works, meters, mains, &c.	1,587	1	0	Meter and fittings rentals	244	8 5
Wages, &c., gas-making	729	3	5	Profits on gas-fittings and asphalting	96	1 8
Lamps—providing, lighting, extinguishing, cleaning, and repairing	319	9	8	Scrip for new shares	6	10 0
Rents, rates, and taxes	386	12	3			
Salaries, Collector's commission, and Directors	854	11	8			
Interest on loans	246	7	1			
Incidental expenses	111	13	11			
Alterations and improvements	319	4	11			
Balance	2,797	10	2			
	£12,185	11	7		£12,185	11 7

Balance-Sheet.

Capital raised	£56,200	0	0	Cost of works, less depreciation	£65,370	12 3
Statutory mortgages	10,000	0	0	Book debts	5,625	15 6
Premiums on new shares	5,494	11	1	Coals, coke, sundry stocks and plant	4,707	13 2
Balances of profit accounts	4,798	16	10	Invested in £910 13s. 7d. Consols	870	17 3
Deposits from consumers	290	3	3	Bankers	3,571	14 4
Sundry liabilities	565	11	2			
Balance	2,797	10	2			
	£80,146	12	6		£80,146	12 6

The Chairman said, as usual, since he had had the honour of occupying the position of Chairman, he had that day, as on former occasions, a very pleasing duty to discharge. It was a matter of pleasure to inform the meeting that the working of the affairs of the Company, during the six months to the 30th of June, had been in all respects eminently satisfactory, and, although the reduction which the Directors had made on the price of gas, both to the public lamps and to the private consumers, involved something like a reduction of profit amounting in round numbers to £1000 a year, he was happy to say that the increased consumption had kept pace in equal ratio with the reduction, and that, therefore, the profit which the Company had made had been in no wise very sensibly diminished. The Directors were thus in a position to inform the Shareholders that the full parliamentary dividend had been earned, the amount being £3 15s. per cent. for the half year, or 7½ per cent. per annum. It would be in the recollection of the Shareholders that, at the last half-yearly meeting, one of the Proprietors called the notice of the Board to the fact that it was time they should recognize the rights of those old Proprietors, who, in the earlier existence of the Company, did not receive the full amount of dividend they might have had under the Company's Act of Parliament. The work of setting about to remedy that state of things involved a great deal of labour; but the Directors made up their minds to do it, and the result was they saw their way clear to inform all the Stockholders whose stock existed in the years 1860 and 1861 that they would receive a dividend of 1½ per cent. for those years. Then he thought it right to inform the Shareholders that as Directors and fellow-townsmen they kept their eyes constantly open to the different necessities of the town; and also to the increased consumption of gas, which had necessitated a still further alteration in their mains, so that the whole of the public should receive an efficient supply. They had also pursued a policy that a certain portion of the work of opening up the roads should be done in the early part of the year, and completed when the season for visitors to Dover had gone by, so that it was not in the power of any captious individuals to say when they liked, "that Gas Company is always cutting up the streets." They had, therefore, during the past two or three months, while the weather continued hot, deferred any such works until the colder weather came. But people should understand the Company were entitled, under their Act of Parliament, to open the streets; therefore, the cession of their work was not obligatory, but simply to enforce the view on their fellow-townsmen that their interests were not forgotten. The report stated that the Directors had erected a gasholder in Trevanion Street, and they found that they were enabled, as a result, to give the town proper an ample supply of gas, and their policy was to put as much gas in the meters of all consumers as they could possibly want, so that they might have as much as they pleased. He thought he might refer to the Manager (Mr. R. H. Jones), and get from him the fact that for many months past they had not had any complaint as to insufficient supply. And he was also happy to say that the consumption of gas was gradually increasing, so that for the last few weeks, compared with the corresponding period of the past year, it had averaged an advance of from 14 to 16 per cent. The Shareholders saw that the Company were standing well in the financial world; and the Directors, therefore, thought it was a good opportunity to make some change in the interest which they paid upon their debentures. Up to now they had been giving 5 per cent., but inasmuch as the security of the Company was as good as the Bank of England, the Directors thought it only right that they should put out this money at 4 per cent. Without going outside the town, as the report stated, nearly the whole of their debentures had been taken up at 4 per cent., and before they applied to anybody outside the Company, they thought it only right first to give the Shareholders notice that there was still a small sum for which they should be glad to receive offers. Turning to the financial part of the report, during the past half year the sum of £4720 worth of coal had been used, and purifying materials had cost £113; and really it was very amusing indeed to see that this matter of £113 had been taken up by somebody or other, and remark had been made upon the conduct of the works and the purifying of the gas, as if that sum represented all they had spent in purifying their gas. Whether it was so or not, he would challenge the writer, and he would invite him to come into the works and prove that they were not carrying them on strictly within their powers, and making as little nuisance as possible. Upon the profit and loss account it would suffice to say that there stood a balance to the credit of the Company, for the past half year, of £2797 10s. 2d., on which they were prepared to pay £3 15s. per cent. dividend for the half year. He might also add that during last half year they put away upwards of £800 as a reserve-fund—a practice which they should continue, inasmuch as they could then look forward with a certainty of earning their dividend during the current half year. In conclusion, he moved that the report of the Directors be received and adopted, and that a dividend for the past half year at the rate of £3 15s. per cent. be declared, and also the dividend which accrued in 1860-61, being at the rate of £1 10s. per cent., be made up and paid.

Mr. E. Bottle seconded the motion.

Mr. Philpott asked whether there was any power given to the Shareholders in the Act of Parliament to claim back dividends for the years 1860 and 1861. If there was no power given, he, for one, did not approve of it, for the simple reason that, under the present circumstances, things did not look very satisfactory with regard to the future of gas companies. Consequently, if there was no right, surely a shareholder should not ask for money that was not earned, and could not be given 20 years ago.

The Chairman said Mr. Philpott was insulting the Board by questioning their policy, and assuming that they were taking a course they had no legal right to do. It was most distinctly set forth, and back dividends had been paid by other companies in the kingdom.

Mr. Philpott said if they had a right, he had nothing else to say; but if they were not bound to do so, it was far preferable to accumulate a reserve-fund for future contingencies. Then, again, he wished to ask, as they could not pay more than 7½ per cent. by Act of Parliament, was there power to give the Shareholders a bonus? because he saw at Faversham they paid £2 per share bonus. If that could not be done, he thought all the money that possibly could be should be accumulated for the purposes of a reserve-fund, so as to ensure 7½ per cent. as long as possible. He was glad to see it had been commenced, and hoped it would be continued.

The Chairman said the Directors had acted altogether within the scope of their powers. He guaranteed that the Shareholders would much rather have the bright guineas in their own pockets than in the safe keeping of the banks of the town. If they did not divide this money it must go to the reserve-fund. They were limited in their dividends to 7½ per cent., and when they should have paid up that dividend, and supposing their profits exceeded what they required, after having put by a sufficient reserve-fund, the time would come when they would further reduce the price of gas. They were all equally interested in the matter, and he believed, in the course the Directors took, they rendered the Company as safe as it possibly could be.

The motion was then put and carried.

On the motion of Mr. Peake, Mr. T. W. Fry and Mr. E. Bottle were re-elected Directors of the Company.

The Chairman proposed that Mr. H. Hayward be re-appointed Auditor.

Mr. Grant seconded the motion, which was carried unanimously.

Mr. Philpott moved a vote of thanks to the Chairman, which was carried unanimously.

The Chairman, in responding, said he was very much obliged to the Shareholders for their cordial vote of thanks, and he assured them it was a source of considerable gratification to see that the progress of the Company was in all respects eminently satisfactory. Supposing the electric light should be successful, so far as man could speak, he would tell them that they should still come and receive their full parliamentary dividend of 7½ per cent.; and when one spoke of what might occur in ten years, he remembered when railways first came into vogue, how people said the four-horse coaches would be put down, and what would become of the poor horses. Railways had displaced horses, it was true, in the way of taking passengers, but still he ventured to say that a greater number of horses were never employed than at the present moment. In the same way with gas; its supply was gradually being extended throughout the place from time to time. How many people that day did not light a fire because they had a little apparatus on which they could boil their potatoes and water by means of gas. It was also used in the working of machinery, so that the consumption would still go on, and he hoped any shareholder who had any fear about the electric light displacing gas, would cheer up and not be prejudiced.

The meeting then separated.

THE WATER SUPPLY AND THE DISPOSAL OF THE SEWAGE OF EXETER.

A Meeting of the Exeter Town Council was held last Wednesday—the Mayor (Mr. H. D. Thomas) in the chair—when it was reported that a meeting of the Council in Committee was held on the 18th ult., for the purpose of considering the various schemes proposed for supplying the city with water, which were as follows:—1. Messrs. Galbraith and Church, from Dartmoor. 2. Mr. A. C. Pain, from the River Culm, in the Blackdown Hills. 3. Mr. Richard Hassard, from Exmoor. 4. Mr. Jenkin (*a*) by pumping water from the Teign; (*b*) from the Woodbury Hills; (*c*) from the Whitstone Woods; (*d*) from Dartmoor by gravitation. 5. Mr. Greenhill, from the well at Trew's Weir mill. 6. Mr. Stooke, by artesian wells. 7. Mr. Lambert, from Rolestone. The Committee resolved to report to the Council that inasmuch as the Corporation have lately acquired the undertaking of the Exeter Water Company, it is not, in the opinion of the Committee, desirable at the present time to enter into any schemes for the procuring of water from any other source, the water at Lion's Holt being excepted.

Mr. Hirtzell said there could be no doubt that the water which had been for some time past supplied to the city was not of that purity which the city had a right to demand; and, as a reason for passing this resolution in Committee, it was suggested that the course for the Council to take was to adopt the best means in their power of procuring a pure supply, and then see whether the supply was sufficient for the city. Whether the deposit of sewage in the River Exe did or did not, as alleged by some scientific men, convey germs of disease to the towns below, it was obvious that there was a very powerful feeling in the mind of the public on the subject. It was quite possible—in fact, he believed it to be quite probable—that these scientific men were right. Therefore it was their duty, as the Sanitary Authority, to take the best means they could to purify the supply of water they offered to the citizens; and the proper way of doing that was to avail themselves of the powers of the Rivers Pollution Act. He therefore moved—"That the Town Clerk be instructed and directed to give the requisite notices, under the Rivers Pollution Act, to all towns and villages which at present discharge their sewage into the River Exe, above the point from which the supply for this city is drawn, to discontinue the practice at a given date."

The Mayor said that such a resolution would include their own sewage.

Alderman Norrington seconded the motion. He said that he had suggested in Committee that, having purchased the water-works at an immense cost, the Council ought to do their best with them. When the schemes of Mr. Stooke and the others first came before the Council, they had not become possessed of the works; but now that they had bought them at a cost of over £100,000, it would be madness to throw away the money for the purpose of engaging in a large and doubtful investigation. A man did not foolishly throw up a good house because he happened to see a better one—he made the best of what he had. The Council were just in that position. More than that he had contended—and the various analyses that had been made justified him in the assertion—that the Exeter water, when taken from the river, was an exceedingly good and wholesome drinking water. But the very fact that the Exe received the pollutions of Tiverton and other places on its course, made the thing impure to the mind, and was not at all a pleasant association. This could not possibly do any good to the water, and he believed, in times of disease, especially when fever prevailed, there might be germs in the water which they ought to avoid. It was said that running water always tended to purify itself; at the same time, he would rather have water pure at its source than water which had to depend upon purifying itself by running. It had been whispered that if the Council called upon the Authorities up the stream to keep their impurities out of the water, they ought to begin at home; but it must be remembered that the sewage of Exeter fell into the river when the river was past all drinking purposes, and it could do no harm except by its effect on the atmosphere. He was an advocate for the removal of sewage from the river in all cases. Still, the fact that they

were discharging sewage at Exeter ought not to be an insuperable objection to their instructing the Town Clerk to take what steps he could for preventing it higher up. Of course, if it could be shown that any one drank the water of the Exe after it was made impure by Exeter sewage, that would be a substantial argument. But to go on year after year, even after having become the owners of the water-works, allowing the inhabitants of the various districts above them to pollute the source of their supply, was perfectly absurd, and they ought to stop it as soon as they could.

Mr. OWEN said that he could supply Alderman Norrington with the "substantial argument" to which he referred. He had reason to believe that there were several houses near the river, in the parish of St. Leonard, which were not at the present moment supplied with water from the works, and the inhabitants had to draw all their supply from the river.

Mr. PEARSE said the Council were put in rather a difficult position. If the mover and seconder of the resolution intended to go in with all their heart and soul for the removal of sewage from the River Exe, then the Council might support them. But from the argument used by Alderman Norrington, he seemed to be of opinion that there was no harm done at present by the flow of Exeter sewage into the river. Was there no harm, however, done in any other sense? It was a question even now whether the town suffered more from drinking bad water than from breathing bad air. It was a question whether the ponding back of the sewage in very dry summers, between Trew's Weir and Exe Bridge, and so diffusing polluted air over the city, was not the cause—or one of the causes—of the great amount of illness in the city. He thought the Council ought to begin at home, before asking other towns to prevent their sewage from flowing into the river, or they would be greeted with "Clean your own platter first." If they set the law in motion to compel Tiverton and other towns to remove their sewage, they might rely on it that there would very quickly be a movement to compel Exeter to do the same thing. He had no objection to that—not the slightest. In his opinion they ought to have dealt with the sewage question long ago; but he really thought that even now they ought to do so before calling upon Tiverton to take its sewage out of the river. If Tiverton was poisoning the people of Exeter, the latter could not shut their eyes to the fact that they were doing something towards poisoning themselves.

The MAYOR said there was a report from the Sewerage Committee; also a letter from Earl Devon with regard to the pollution of the Exe by Exeter sewage. He thought, therefore, that the pollution of the river by themselves, and the action to be taken with regard to pollutions from above the city, were subjects that might well be kept separate. Mr. Hirtzell's motion was to compel the people above the city of Exeter to comply with the Rivers Pollution Act.

Alderman RICHARDS said he could not see why the two things should be mixed up. Mr. Hirtzell's resolution aimed at purifying the source of the Exeter water supply, and that was a matter which ought not to be delayed. The question of dealing with their own sewage would be quite enough to engage their attention when it came on in its separate form.

Alderman BUCKINGHAM said that he could not agree with those who thought they should not interfere with the people up stream. It would be of little use to divert their own sewage if they did not do all they could to make the stream pure in its entirety. As far as they could see, Tiverton was making no attempt to get rid of its sewage in any other way. Exeter had initiated proceedings, but Tiverton had not begun. Even if they called upon Tiverton at once, Exeter could say with truth, "We are preparing to deal with our sewage in an effectual manner," for the Council had this year purchased land for the purpose of enabling them to do so. Therefore he did not regard Mr. Hirtzell's resolution as premature. The form in which the notice was given to Tiverton would be a matter of some consequence. They did not want Tiverton to move instantly, but would call attention to the fact that the work must be done, and that they would expect it done within a reasonable time.

Mr. WILKINSON thought the matter required further consideration, and suggested that it be referred to the Sanitary Committee.

Mr. HIRTZELL, replying on the discussion, said it seemed to be the unanimous wish of the Council that this matter should be pressed, and he could see no good in referring it to a Committee. It was the general opinion they were suffering from the projection of sewage into the river above the source of their water supply, and it was useless to delay action for a day if they intended to utilize that source of supply. He proposed in Committee that the consideration of the various schemes should be postponed indefinitely; and he did so because he believed that eventually they would be obliged to get a supply of water by gravitation, if they were to have a continuous supply. At the same time, he was one of those who wished to save the pockets of the ratepayers, and if the Council were satisfied that by the removal of sewage from the Exe they would have a sufficiently pure supply, why go to an immense expenditure in bringing in another supply before utilizing the existing one to its fullest extent? Believing that delay in a matter of such serious importance to the public health, as the purification of the water supply, was exceedingly dangerous, he pressed his motion.

The proposition was then put and unanimously adopted.

The TOWN CLERK read the following letter, which had been received from the Earl of Devon, addressed to the Mayor:—

Powderham Castle, Exeter, Sept. 11, 1878.

Dear Mr. Mayor,—As I believe that a Committee has been appointed by the Town Council on the subject of the sewerage of Exeter—regard being, no doubt, had to the provisions of the Rivers Pollution Act—I trust that, as a resident in the neighbourhood of the city, I may be permitted to address you shortly in reference to one or two of the points which they will have to consider. The question of the mode of dealing with the sewage of cities and towns is one of the most pressing subjects of the day, and the appointment of the Committee shows that Exeter is fully alive to its importance.

I have no right, and, certainly, I have no wish, to volunteer any opinion or advice; but, as some contribution to the material information which it will be necessary to collect, I am desirous of stating one or two facts. The sewage at present finds its way into the waters of the Exe. Of the nuisance which this produces at certain times and in certain places in Exeter, the Committee can form a better judgment than I can; but I am bound to say that the nuisance created lower down the river is often serious, and calls out for abatement. The smell pervading a portion of the lower part of my park, and especially affecting my boat-house, inhabited by two families, and the Rectory House of Powderham, has, at times, for a considerable period, been exceedingly offensive, and is of a character quite distinct from that which would arise from seaweed if unmixed with other matters. At Starcross, too, I hear, at times, very serious complaints, and I have myself occasionally experienced the nuisance.

For myself, I do not doubt that this arises from the accumulation of sewage matter in certain parts; perhaps holes in the bed of the river, where it becomes mixed with weed. It seems to me of the utmost necessity that, while it is difficult to remedy the past, effectual steps ought to be taken to prevent for the future any aggravation of the evil, by averting all discharge of sewage matter into the river, and thus preventing future pollution from that source.

I venture respectfully, but earnestly, to press this matter upon the early and careful consideration of the Town Council as one which is of extreme importance, as well to the city as to the towns and villages on the banks of the estuary.

I may, perhaps, add in conclusion, that while I thus write partly from the interest which I feel in this neighbourhood, I am also actuated by a sincere desire to see a state of things brought about, under which the city of Exeter, distinguished already by its antiquity, the beauty of its situation, and the mildness of its climate, should deservedly rank high among the cities of England for freedom from all which operates to impair its reputation for salubrity, or to affect its attractiveness as a residence.—I beg to remain, dear Mr. Mayor, yours very faithfully,

DEVON.

The Right Worshipful the Mayor of Exeter.

On the motion of Mr. HUGHES, the letter was referred to the Sewerage Committee.

The Parliamentary Water Committee reported that a meeting of the Committee was held on the 21st ult., when the Dartmoor and Exeter Water Supply Company's bill of costs, amounting to £2816 6s. 1d., having been presented, it was resolved to recommend that the sum of £1700, balance of the sum of £2000, the maximum sum agreed upon by the Corporation, be now paid.

The report was agreed to.

The City Water Committee reported, among other things, that they had paid to the Exeter Water Company the sums mentioned in their last report, and had received from the Company the balance of the half year's collection from Lady-day last, and they had accordingly made arrangements for payment of the half year's annuities, which would fall due at Michaelmas. The rules and regulations for future service-pipes and fittings were under the consideration of a sub-committee, and would soon be issued to the public for their guidance. The Committee had as yet been unable to determine upon a scale of charges to be adopted for the supply of water generally by meter. The subject had already received a great deal of attention, but its importance demanded still more consideration and discussion. The recent emptying and cleansing of the filter-beds at the reservoirs had disclosed a defect to which was due the delivery lately of imperfectly filtered water. The Committee had instructed the City Surveyor to take every possible precaution to prevent a recurrence of the mishap, and had directed him to bring up a plan and report of what he considered necessary to ensure perfect filtration. At the suggestion of the Streets Committee, the Committee had considered the desirability of fixing a certain number of hydrants throughout the city, and experiments had been instituted for the purpose of determining the position and number of the hydrants required; but the Committee deferred their report upon these experiments. The Committee asked for instructions in regard to giving notice to redeem the annuities. As the Act of Parliament did not receive the Royal Assent until the 22nd of July, it was too late to give the required three months notice to redeem at Michaelmas, and the Committee recommended that they should be empowered to give to the annuitants notice of the intention of the Corporation to redeem the annuities at Christmas next.

Mr. WILLEY complained that the report was rather brief and condensed. He said he should rather have expected, upon such an important undertaking, to have been furnished with more details. He should have been glad, for instance, to have heard that the Committee had recommended to the Council the appointment of a competent water engineer. The important question had been raised as to the necessity for a continuous supply of water, and the citizens of Exeter would never be content until that continuous supply had been provided. The appointment of a water engineer was very important, and he should have been glad to hear that it had been taken into consideration. There were also large transactions in the purchase of iron pipes, on which the Council should have had some information. The Council should not have had such a condensed and circumscribed report from the Committee.

Alderman RICHARDS moved that the report be received and adopted, and deferred his observations.

Alderman LLOYD seconded the motion. He said as regarded the full report required by Mr. Willey, it amounted to this—they had confidence in the City Water Committee, or they had not. If not, let them put it to the test by taking a vote upon it; if they had confidence, let the Committee carry out their arduous work without interruption. The fullest possible scope ought to be given to the Committee.

The MAYOR said that he had a suggestion to make to the Committee. During the past two or three years a large number of wells throughout the city, including his own, had been closed—wells that formerly supplied the inhabitants with an abundant quantity and beautiful quality of water—in consequence of percolation into the wells having rendered them useless. The system that prevailed under the Company—that no householder should draw a supply from the main without additional payment, was a disadvantage to the city. If that system were altered, and a tap for water for drinking purposes were allowed to be fixed to the main, it would be an advantage to the city, with certain reservations and precautions as to the sort of tap to be applied.

Alderman RICHARDS said that why the City Water Committee asked—for a little latitude he was going to say—for the confidence of the Council was, that it would be impossible for the Members of the Committee to give their undivided attention to the work if they had any doubt as to their resolutions being final. The Committee did not wish to usurp the functions of the Council, but to ask the Council to give them the authority which the Act of Parliament provided. As regarded the appointment of an engineer, he did not exactly know what description of engineer Mr. Willey had in his mind—Mr. Hawksley or any other. He hoped the Council would not ask too much of the Committee. They were trying to get a thorough knowledge of affairs, and to do all they could for the benefit of the city, and at the same time they did not wish to throw cold water upon any suggestions of the Council. The Committee would do the best they could to consider the points suggested to them. As to the iron pipes, all that had been done was to keep up the stock, and they had not gone into any expense that they were not bound to incur; and if they could get any hint as to where they could purchase iron pipes more cheaply than they had been in the habit of doing, they would only be too happy to act upon it.

The report was then adopted.

THE PROPOSED PURCHASE OF THE CARDIFF WATER-WORKS BY THE CORPORATION.

A Special Meeting of the Cardiff Town Council was held last Tuesday—the DEPUTY-MAYOR (Alderman David) in the chair—to consider whether the Corporation should, under the terms of an agreement between them and the Water Company, give notice of their intention to purchase the works during the present year; but, after a short discussion on the propriety of excluding reporters from the meeting, the Council went into Committee upon the question.

The *South Wales Daily News*, of Wednesday, in referring to this subject, says: "The Town Council of Cardiff was specially convened yesterday to consider the proposed purchase of the water-works. As a matter of prudence, it was deemed wise to exclude newspaper reporters from the meeting; but as the event proved, nothing was gained, while a great deal of valuable discussion was lost to the general public. There was nothing really secret to keep from the public; and, remembering that a provisional agreement had been duly signed, binding the Water-Works Company, nothing should be kept from the public eye. Singular as it may seem, very little was added yesterday to what was published in the *South Wales Daily News* of the 13th of March last. As five months have elapsed since then, we may state that the provisional terms of agreement are as follows:—'1. The Corporation to elect at any time within twelve months from the passing of the Bill to acquire the whole of the undertaking (including in that expression, among other things, all lands, properties, and powers, but excluding the reserve-fund of the Company) by

purchase. 2. The amount of the purchase-money of the undertaking to be £300,000, to be paid within two years from the passing of the Bill, interest to be paid at the rate of 4 per cent. on the amount of the purchase-money until the payment, and to commence from the day of the election to purchase. 3. Any sums of surplus net revenue over and above the amount of interest on the amount of the purchase-money to be handed over to the Corporation. 4. No extension of works, beyond the ordinary extension of mains and necessary repairs, to be executed without the consent of the Corporation, after notice of their intention to purchase. 5. Any outlay to be repaid to the Company, by being added to the purchase-money. 6. No portion of the works authorised by the Bill to be executed by the Company until after the expiration of the time within which the Corporation may elect to purchase. 7. The whole of the existing debentures to be taken over by the Corporation, in addition to the purchase-money of £300,000. 8. The cost incidental to obtaining the Bill and carrying into effect the sale and purchase of the undertaking to be borne by the Corporation. 9. The purchase money may, if so agreed to, be commuted either for debenture stock or annuities. 10. The Corporation to withdraw all opposition to the Bill in both Houses.' Some additional capital has been called up by the Water-Works Company since the date of this agreement, but that will not affect the price fixed—£300,000.

"As we explained on the 13th of March, the basis of agreement stands thus:—

"Assuming, as stated by the Mayor and Alderman Jones, that the price is to be £300,000, and that the net revenue will be £12,000 per annum, that means that the Corporation will purchase on an ascertained and reliable profit of 4 per cent., or, speaking generally, under 1 per cent. less than the commercial value of the water-works shares in the open market. But in order to judge whether the proposed purchase is, or is not, a sound and a fair one, we must look, first, at what the water-works have cost; secondly, at their present commercial value, as tested by the quotable value of the Company's stock; and, lastly, at the probable amount to be given in the shape of premium for forced sale. The capital of the Water-Works Company stands thus:—

First issue of £100 stock (now paying 12 per cent.)	£45,000	0	0
Second issue, 1860 (now paying 7½ per cent.)	45,000	0	0
5292 shares of £10 stock, on which £5 per share has been paid (now paying 7½ per cent.)	26,460	0	0
Debentures (on which 4 per cent. are paid by the Company)	20,450	0	0
	£136,910	0	0

"When the matter is looked at from this stand-point, the Company are claiming £163,090 more for their works than they have paid for them. This, however, is not the fair nor sound way to look at the Company's property, from a buying and selling point of view. The value of a thing, according to all the political economists from Adam Smith to Professor Leone Levi, is what it will fetch. The test, consequently, of the current commercial value of the Cardiff Water-Works is to be found in the marketable or saleable value of the shares. We present the figures in an aggregate form:—

450 original £100 shares, at their extreme present value of £242 each, are equal to	£108,900	0	0
450 7½ per cent. £100 shares, at their extreme present value of £160 each	72,000	0	0
5292 £10 shares (with £5 only paid), at extreme present value of £10 each, are equal to	52,920	0	0
Present extreme market value of Company's stock and shares	£233,820	0	0
Add 25 per cent. upon £233,820 for compulsory sale	58,455	0	0
Leaving a difference of	7,725	0	0
To make up the proposed purchase sum of	£300,000	0	0

If the proposed purchase is carried out, the Company will receive £66,180, or, roundly speaking, a bonus of 28 per cent. for a forced sale.

"It is understood that yesterday's discussion traversed the question of value, the per centage likely to be charged for the £300,000 to be borrowed, and the condition of the mains, reservoirs, &c. There was well nigh unanimity as to the propriety of purchasing the water-works, but it was deemed judicious to appoint a committee—to consist of Aldermen Jones and Bowen, Mr. David Jones, Mr. Thomas Rees, Mr. Williams, and the Borough Surveyor—whose duty it will be to inquire and make a report to a future meeting. This committee may call in the aid of a skilled engineer. It will, consequently, be seen that, while the public have for the moment been kept in suspense, all the elements necessary to a full understanding of the proposed purchase are being got ready."

ELECTRIC LIGHTING.

[From the *Newcastle Daily Chronicle*.]

"Burning a farthing candle at Dover to show a light at Calais" was the figure of speech by which Dr. Johnson described his idea of the outrageously absurd. Any project of lighting the Channel from the English side would infallibly have been greeted in the worthy Doctor's time with a chorus of irony, the keynote of which might be found in the felicitously expressive phrase which we have quoted. After the lapse of a hundred years, however, we have found that lighting up the Channel would be quite a simple matter. The Danish Government, in fact, is about to do something precisely similar in its nature. Electric lighting, which is only on its trial with us, has already been accepted as a great public advantage in Denmark, and its last application in that country will be hailed as a good idea by those even who do not approve of the application of the electric light generally. It has been decided to light up the important ports of Copenhagen and Elsinore, together with the whole length of the Sound, by this novel and vivid means of illumination. Baltic traders will not hear of the project without agreeable surprise. The Sound is the great gateway to the Baltic Sea. It has such maritime importance, and it is so extensively used by vessels trading to the shores of Russia, Finland, and Sweden, that at one time it brought in a considerable revenue to the Danish Government. It was the Suez Canal of Northern Europe. Dues were levied on each ship which passed through it, and only by European agreement was this inconvenient arrangement brought to a conclusion. The resolution to light the Sound by means of electricity is quite in harmony with that spirit of progress which has recently distinguished the Danish Government. Of all the countries in Europe, Denmark alone has decreased instead of increasing the national expenditure during the last few years of trouble and uncertainty. A saving has been effected in the finances of the country without any sacrifice of the ends of Government. The first result of the application of universal suffrage in Denmark was the election of a Parliament which combined a resolve to limit the public expenditure with a desire for national progress and enlightenment. It decreased the salaries of the high State officials, and devoted the savings thus effected to the purpose of public education. Such an example is not unworthy of being followed in some countries of much greater political importance.

The new and extensive application of the electric light in Denmark will have the influence of a powerful example. The light of the future has very vigorous enemies arrayed against it. It has to contend alike with prejudice and self-interest. Prejudice, however, is a much weaker factor than it was some years ago. We live in such an age of wonders that incredulity is continually sustaining heavy falls. When people were told that a little machine had been invented which not only made the tramp of a fly audible, but actually increased the sound to such volume that it was like a horse galloping over a bridge, they very naturally laughed at the new story from America. When the laugh went against the incredulous, however, it produced a general feeling that, in such a surprising time as ours, it was perhaps as well to wait before ridiculing any newly-announced wonder. But it is an old truism that prejudice dies hard. The microphone and the phonograph and the telephone have been accepted; but the electric light, a much older invention, is yet fighting its way. It is not so very long since the project of lighting the streets by means of gas was regarded as an absurdity. Only a century ago astonished London united in endeavouring to laugh Jonas Hanway out of the absurd habit of carrying an umbrella. The late Earl of Derby's witticism about steamboats has become a proverb of shortsightedness. The reasons urged against the application of electricity to the purpose of illumination are not entirely based on equally untenable grounds. There are large numbers of people who profess to have a dislike to the electric light because of that very vividness and high illuminating power which they acknowledge it possesses. Some object to its ghastliness, others to its quality of casting peculiarly deep shadows. This last objection effectually prevents its application to some purposes. A large manufacturer, who had lighted his works by electricity, resorted to gas again for this reason alone. But against the lighting of public thoroughfares, of great blocks and squares, and of navigable channels, like the Danish Sound, by this means, no such reason can be urged. Indeed, the example of Paris has quite sufficiently proved the enormous advantages of lighting by electricity. The alarm which has been shown by some of the gas companies at the prospect of an extended application of electricity is founded on the intelligible ground of self-interest. Small classes almost invariably suffer when some great addition is made to the public good. The adoption of free-trade principles caused a temporary loss to those persons who had capital invested in agriculture. The invention of a new machine has frequently inflicted real and severe suffering upon special classes of labourers. The author of "Sybil" illustrated this fact most forcibly in some passages of that curious work. Within the last thirty years we have witnessed the utter wreck of more than one great industry because a new machine was invented; but the final result was most beneficial to the country in general, and ultimately, even, to those classes which had suffered most severely at first. The case of the gas companies cannot be placed in comparison with circumstances like these. Even if the most gloomy anticipations of the most desponding shareholders should be realized, the evil would not be an overpoweringly dreadful one. But nothing of the kind is likely to take place. The gas companies may ultimately be dispossessed of the streets by the electric light, as the link boys were driven from the street corners by the introduction of gas; but it is open to very considerable doubt whether or not the article which they produce will be in less demand. The electric light is not likely to enter the private house, and, as we have seen, it has disadvantages in the manufactory and the workshop. In the consumption of gas, on the other hand, there is a continual increase. It is being more and more applied to the purpose of fuel. The ordinary Englishman likes to see his fire, to enjoy the blaze, and to use the poker; but he is rapidly learning that if a coal fire is comfortable in the sitting-room, it is not absolutely necessary to the kitchen.

The electric light has such a vast power of illumination that the probability of its coming generally into use for the lighting of large spaces is little more than a question of cost. Before it can be at all generally adopted, it will have to be at least as cheap as gas. The experiments which have been made in different places have varied very considerably in expense. It has been stated that the lighting of a single street by the system of M. Jablochkoff would cost not less than £1 4s. an hour, whilst the same street might be lighted by means of gas for 2s. 1½d. an hour. M. Loutin, however, has succeeded in considerably reducing the expense of the electric light. To light the outside of a London theatre by his system, and really to illuminate a large portion of the Strand, costs only 2s. 6d. an hour for five lights. This comes very near solving the question of expense; and there is at least reason to hope that fresh experiments will result in still further reducing the cost. Progress in this direction has recently been extremely rapid. M. Jablochkoff lights the streets of Paris by means of an electric candle, the disadvantage of which is that it requires almost constant attention; but his rival inventor has devised a candle which will burn for nearly 20 hours without any attention whatever. There is no reason to apprehend that we have reached the limits of possible improvement. We have attained a constant and steady light, we have made it comparatively cheap, and we have brought it to such perfection, that it may be trusted to look after itself for a reasonably long period. It is natural now to look forward to some further development of the principle. The intention has been expressed to abandon the use of the electric light in some of our lighthouses. In consequence of the old-fashioned system on which it is worked, it has been much too costly. What we have learned recently, however, makes it reasonable to expect that one system of electric lighting will only be abandoned for another. It would be exceedingly unwise to discontinue the use of a light of such marvellous power on the score of cost, when the possible cost is being made easier every day. It may be looked upon as a certainty that within the next few years the electric light will be quite common in our thoroughfares. The Danes are about to demonstrate its great public use in a manner highly creditable to the Government of that country. In England, where we are so proud of our progress, there are signs that we shall not be long in following so good an example.

THE LANCASHIRE COAL AND IRON TRADES.

(FROM OUR OWN CORRESPONDENT.)

Rather unexpectedly, the price of round coal in the Manchester market has, this month, been advanced, the leading firms having put up their delivery prices to private consumers 1s. 8d. per ton, and their wharf prices 10d. per ton, whilst at some of the pits in the outside districts, advances of 5d. to 10d. per ton are being made. Whether, however, the increased demand so far for house-fire classes of fuel is such as to warrant this upward movement in prices is doubtful, and in the South-West Lancashire districts no general upward movement of a similar character has yet been proposed. Indeed, so long as the majority of the pits are not going more than about half time, and there are such heavy stocks at many of the large collieries, any material advance in prices would seem to be out of the question, whilst so far as common classes of round coal are concerned, the demand for general manufacturing purposes is still so small that, where colliery proprietors have to push for sales, extremely low prices have to be taken, and considerably below their nominal list rates. Engine classes of fuel are without material change, except that slack is becoming more plentiful in the market.

To some of the home ports a fair quantity of coal has recently been shipped; but, generally, the shipping trade is still very dull, and the prices low.

The depression in the iron trade seems to increase, and there is now little or no hope of any improvement until next spring. Lancashire makers of pig iron, although they are at present securing no new orders of any importance, hold for their full list rates, as the orders taken early on in the quarter are absorbing the bulk of the output of the furnaces in blast, and makers of outside irons offering in this market also show but little disposition to make further reductions; but there is a good deal of underselling amongst merchants, and buyers who have orders to give out can place them at very low figures. For finished iron the demand is still only small, and with the exception of one or two of the Lancashire forges, local manufacturers, as a rule, are very short of orders. There is, however, no material change in prices, Lancashire bars delivered into the Manchester district being now quoted at about £6 per ton.

THE COAL AND GENERAL TRADE OF THE NORTH OF ENGLAND.

(FROM OUR OWN CORRESPONDENT.)

There was an improvement in the shipments of all kinds of coal last week, though it hardly brought them up to an average. There is a scarcity of steam tonnage at present. In consequence, some orders were not executed last week. Coasting rates were higher—in some instances from 3d. to 6d. per ton. Of course, this is only temporary. The best gas collieries in the county of Durham are at full work. Prices continue at 7s. best, 6s. second. Steam coals were about 3d. per ton lower last week for the best qualities, and second-class coals were disposed of at various rates. Most of the second-class pits are very badly employed. Some of them have given their men notice of the termination of their present engagements, as it is intended to close the pits; but arrangements may be made, and by the men taking lower wages they may be kept open. Except for South Hetton and some of the higher class of coals, the household coal trade is very moderate. Best sorts are disposed of on the Tyne at from 9s. to 9s. 6d. per ton. Cargoes of gas coals continue to be shipped to Ireland, as the nature of the freight enables it to be done at a profit. The shipments of gas coals to the Baltic and the North of Europe are less. The shipping season thence is coming to a close.

The freight markets, not only for coasting, but upon most other outward rates, are firmer. Homewards the freight for corn sent from the Black Sea does not much exceed 20s. per ton, which is very low. Outward coal rates generally are likely to remain pretty firm until the close of the Baltic season sends more steamers into the coasting trade.

The general manufacturing trade of the Tyne is extremely depressed. The chemical market was low all last week. There is keen competition for foreign shipping orders. Many manufacturers are obliged to bring their goods into the market, and dispose of them, though trade is against them, to raise money. The prospects for the winter are not at all satisfactory. Recent events in the East have made merchants excessively timid, and there is an entire want of confidence. The lead trade of the Tyne is very depressed. The importations of timber continue limited.

TRADE NOTES FROM SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

On Thursday last, the thirteenth half-yearly meeting of the West of Scotland Association of Gas Managers was held in the Town Hall, Kilmarnock, under the presidency of Mr. Samuel Stewart, of the Greenock Corporation Gas-Works. It was a very marked success in every sense of the term. The attendance was large, the President's address and the papers submitted by several of the members, together with the discussions to which they gave rise, were of very considerable interest. An exceedingly animated and profitable discussion arose on the subject of exacting deposits from gas consumers, which was originated by a paper read by Mr. M'Gilchrist, in the course of which he told the meeting of the good results that had been effected in Dumbarton by levying deposits from *all* consumers, and paying interest at 5 per cent. upon the same. The Chief Magistrate of the town, Provost Sturrock, a well-known coal master, was present during a part of the sitting, and joined in the discussion on a paper on "Drying Coal," submitted by Mr. Henry Aitken, of Falkirk. Provost Sturrock also attended the dinner which was held after the more formal portion of the day's work was done. Much of the success of the meeting was due to the hearty co-operation of Mr. Samuel Dalziel, Manager of the Kilmarnock Corporation Gas-Works, which, by the way, were visited by the members in the course of the afternoon. On account of the fact that Mr. Dalziel has been very successful in carrying on the "secondary products" department of his works, the chemical side of his establishment was keenly scrutinized. The spring meeting of the Association is to be held at Coatbridge, where the local Manager, Mr. Mitchell, is engaged in erecting very extensive new works outside the town.

Since his appointment as Manager to the Pollokshaws Gas Company, about a twelvemonth ago, Mr. Adam, formerly of Kirriemuir, has been engaged in making very important extensions to the works under his charge. The leading feature of the extensions is a new telescopic gasholder of a capacity of fully 100,000 cubic feet. Considering the fact that the maximum daily consumption is up to 120,000 cubic feet, it is rather surprising to learn that until now the storeage capacity at the works has only been about 35,000 cubic feet. It may be mentioned that Pollokshaws is an ancient royal burgh just a short distance outside the southern municipal boundary of Glasgow, and it affords almost the only example of an independent gas supply undertaking in the suburbs of the great city. The annual make has now risen to about 20,500,000 cubic feet. There are several factories and other industrial establishments in and around Pollokshaws.

At a meeting of the Directors of the Couper Angus Gas Company, held last Thursday, Mr. Alexander Young, of Coupar Angus, was appointed Manager to the Company, in room of Mr. T. Inches, resigned. In recognition of Mr. Inches's long and faithful services, extending over a period of 22 years, it was agreed that a suitable token of respect be presented to him on an early date, and a small committee were appointed to carry out the wishes of the Board in the matter.

The last quotation of the £10 Dundee Corporation Gas Annuities was £240. The 9 per cent. and 6¾ per cent. Glasgow Corporation Gas Annuities are quoted at £215 and £161 10s. respectively. As the taking over of the St. Andrew's gas supply by the Town Council is now one of the possibilities of the immediate future, it may be mentioned that the £12 shares are quoted at £22 10s., and that the last dividend paid to the Shareholders was 12½ per cent.

It has been unanimously resolved by the Parochial Board of Forgan, Fifeshire, to form Newport into a special water supply district, and to approve of negotiations which have been some time in progress with the Water Commissioners of Dundee for a supply of water from the Lintrathen works, and with the North British Railway Company, for the laying of the necessary piping along the Tay Bridge. The Dundee Water Commissioners undertake to construct a reservoir on Wormit Hill, near the south end of the Tay Bridge, and to deliver the water there for the supply of Newport, the estimated cost of the necessary works being £4604, and the charge to the consumers being an annual payment of 5¾ per cent. upon the cost, and 6d. per 1000 gallons, which is the same price as the Dundee manufacturers, who consume by meter, pay. The assessment upon the ratepayers will probably be 1s. 6d. per £1 of rental. It may be mentioned that the population of Newport consists largely of the merchants, manufacturers, and professional people who carry on business in Dundee.

The Greenock Water Trustees have fixed the public water-rate for the town at 1½d. per £1 instead of 1¼d., as formerly agreed upon. Even with that further reduction, it is confidently expected that there will still be a respectable sum to the good. There is now no fear that the millowners and sugar refiners will be put on a short supply in respect of the water required for motive power, as there has been a considerable rainfall during the last two or three weeks. Reports were in circulation recently regarding the alleged impurity of the water supply of Greenock, but Mr. Biggart, the town analyst, has shown, by careful examination, that the water may be considered quite wholesome and well suited for dietetic purposes.

Mr. Bailey Denton, C.E., of London, whose name is so well known in connection with sewage farms, has been appointed by the Forfar Police Commissioners to superintend the laying out of the ground selected at the farm of Orchardbank for the purification of the town sewage. They have also accepted an offer for the construction of the main outlet sewer and brick culvert, extending to a length of 1690 yards, the contract price being nearly £3000. In these selections, the Commissioners have been guided mainly by the advice of their Engineer, Mr. J. F. Bateman, London.

Mr. John Buchanan, C.E., Edinburgh, has submitted to the Inverkeithing Town Council a report, in which he sets forth that works necessary for the obtaining of a water supply for that burgh, under a combined scheme with Charlestown and Limekilns, from the Dunfermline Water Commissioners main at Milesmark, will cost £3341. The best route for the pipe track will be about 6¾ miles in length. The Town Council have unanimously resolved to adopt the scheme, and they now only await the decision from Charlestown and Limekilns district to proceed with the work.

The Glasgow pig iron warrant market has been exceedingly dull and heavy during all the past week, and a large amount of business has been done at receding prices. Up till Friday afternoon the decline had reached to 9d. per ton over the week, thus making a fall of 1s. 6d. per ton since the 13th of September.

There is still a marked degree of stagnation in the Glasgow coal market. The shipping business is dull, and local trade is but indifferent. Prices remain very unsatisfactory.

MARGATE GAS COMPANY.—At the half-yearly meeting of this Company, on Friday, the 13th ult., it was decided to reduce the price of gas to 3s. 6d. per 1000 feet, and at the same time a dividend of 7½ per cent. was declared.

REDUCTION IN THE PRICE OF GAS AT ST. MARY CHURCH.—The St. Mary Church Local Board announce a reduction in the price of gas, as from the 30th ult., from 5s. to 4s. 6d. per 1000 feet. A similar reduction was made this time last year.

PURCHASE OF THE WOMBWELL GAS-WORKS.—The question of the Wombwell Local Board purchasing the gas-works, which were erected about ten years ago by a private company, has at length been settled. The Board recently held a meeting, at which a committee were appointed who have concluded negotiations for buying the whole of the plant for a sum of £8000.

SALES OF GAS SHARES AT BISHOP AUCKLAND.—Last Friday there were sold by public auction 2000 shares in the Bishop Auckland Gas Company of the nominal value of £10 each, being part of the new capital authorized to be issued by the Bishop Auckland District Gas Act, 1877. The shares were put up in lots of five, and the whole of them were sold, realizing prices from £11 to £12 each.

BOLTON CORPORATION GAS-WORKS.—At a meeting of the Gas Committee of the Bolton Town Council, on the 20th ult., the Town Clerk placed before the Committee 42 applications for the office of Engineer and Manager of the works, in the place of Mr. Harrison Veevers, resigned. It was resolved that six of the applicants should attend a meeting of the Committee held last Wednesday, when Mr. A. C. Fraser, Manager of the Barrow-in-Furness Gas and Water Works, received the appointment.

EXPLOSION OF GAS AT REIGATE.—Last Wednesday an explosion of gas occurred at the Reigate Public Hall. It seems that some men who were engaged repairing the gas-pipes in the meter-room, after, as they supposed, allowing it to get clear, took a lighted candle to test their work. An explosion ensued, which was distinctly heard half a mile off, and which blew up the boarding of the principal staircase, shattered doors and glass, and generally did a great deal of damage to the building. The men were knocked down, but not otherwise injured.

HONITON WATER SUPPLY.—The Honiton Town Council have just received a compulsory order from the Local Government Board, requiring them to carry out at once certain necessary sanitary arrangements. After referring to the provisions of the Public Health Act, 1875, the order goes on to state:—"Now, therefore, we, the Local Government Board, in pursuance of the powers given by the statutes in that behalf, hereby order that the said Authority shall perform their duty in the matter of the said complaint, and shall commence within four months from the date of this order to execute all the works necessary for providing a proper supply of water for the said borough, and shall proceed therewith until completion."

SERIOUS EXPLOSION OF GAS AT WARRINGTON.—Yesterday week an explosion of gas, resulting in the serious injury of four persons, occurred at Warrington. A Mr. W. Clayton, of 139, Dellam Lane, noticing a strong smell of gas in his front room, went with his wife to look for the escape. Nothing was discovered about the meter, which was in the parlour, and Mr. Clayton laid a candle he carried on the floor whilst he opened a cupboard door. No sooner was the door opened than a severe explosion took place. Mr. and Mrs. Clayton and their two children, aged respectively two and five years, were much injured, and all are in a critical state. The windows and front and back doors were blown out, the parlour floor torn up, and the whole house made a wreck. Mr. Paterson, the Engineer of the gas-works, went with some men to find out where the leak was, and they discovered that a 3-inch main in front of the cottage had been crossed by a drain several years ago. As the soil underneath the main had subsided, and there was no support for it, the weight of the drain had caused a fracture, and the gas escaped, gathering under the floor of the front room until it was ignited by the candle carried by Mr. Clayton.

EXHIBITION OF GAS APPARATUS AT BRIDGNORTH.—Following in the wake of other towns, the Bridgnorth Gas Company, at the suggestion of their Manager (Mr. J. Gill), last week held an exhibition of gas apparatus, entirely devoted to the use of gas apart from lighting. Messrs. John Wright and Co., of Birmingham, and Messrs. Billing and Co., of London, were the principal exhibitors, and both displays were highly creditable. On Tuesday and Wednesday evenings Mr. H. Gore, of London, delivered his

two popular lectures. A very good audience assembled to hear the first, and on Wednesday the hall was crowded to excess, all the standing room being occupied—a clear evidence of the interest excited. The result of the exhibition has been very satisfactory to the Company; the sales of stoves and apparatus in the room amounting to upwards of £150, which means a very important increase in the consumption of gas at Bridgnorth. Each effort made by Companies to enlighten the public on the value of gas for heating and cooking purposes will materially enhance the value of their property, and the large attendance which Mr. Gore secures to his lectures proves that the public are anxious to obtain reliable information, and will listen quite as readily to a truthful exposition of the advantages of gas as they formerly did to the ridiculous tirades of cheap-gas agitators. Among the exhibits at Bridgnorth, one of Otto and Co.'s silent gas-engines was at work; this was sold in a few hours after the exhibition opened, and several more are inquired after. Mr. Gill deserves special praise for the care and attention he displayed in carrying out the arrangements of the exhibition.

Clay Cross Gas Supply.—About a year ago a committee of ratepayers of Clay Cross was formed for the purpose of endeavouring to obtain a reduction in the price charged for gas, which is supplied to the place by the Clay Cross Coal and Iron Company. An interview was held with Mr. Charles Binns, J.P., the General Manager of the Company, which led to a reduction not only of the price charged per 1000 feet, but also a material reduction of meter-rent. However, as there was a contract with the Clay Cross Local Board for the street-lamps, Mr. Binns would not consent to any alteration respecting the charge for them until the Board had given six months notice to terminate the same according to contract. Last March the Local Board gave six months notice, which expired on the 29th ult. The Gas Committee of the Local Board decided to call a meeting of the ratepayers on the subject, and this was held on Monday, the 23rd ult., when they reported that they had come to the conclusion to offer the Company 35s. a year per lamp, instead of the present charge of £2 2s.; and if the Company refused that, to offer them 4s. per 1000 feet to burn by meter. Ultimately the meeting, after various resolutions had been moved, adopted the following, with only one dissentient:—"That it be left in the hands of the Local Board to obtain the best terms they can." Accordingly, the next day, a special meeting of the Local Board was held, when there was read the following offer from the Clay Cross Company:—"The Clay Cross Company will light the town of Clay Cross with the present lamps on terms as under:—If the lamps are lighted according to the agreement hitherto in force, for the annual sum of £2 2s. per lamp. If the lamps are lighted on the same days and times as hitherto but put out at midnight, for the annual sum of £1 14s. per lamp, but if the cost of lighting the lamps be reduced, the charge per lamp to be reduced accordingly; or if the Local Board choose to burn by meter, the said Board must pay for the fixing and rental of meters and for the gas used at the rate of 4s. per 1000 feet. The Local Board may buy or pay rents for the pillars, lamps, &c., and pay the person who lights them, or the Clay Cross Company will light, clean, and maintain all lamps and lamp-posts, and supply and fix all new ones where they have mains, at one penny per day per lamp for the number of days the lamps are lighted, such number of days not to be less than 180. Where additional lamps are required, the Clay Cross Company will require an agreement for them extending over five years." After some discussion it was resolved to refuse these terms, the result being that Clay Cross will be in darkness till other arrangements are made.

Register of New Patents.

2716.—Ortmans, V. C. J., Brussels, "*An improved rotatory pump or apparatus for raising and forcing fluids, applicable also as a motive-power engine, and for other purposes.*" Patent dated July 14, 1877.

This invention relates to a construction of pumps or rotatory continuous acting apparatus for raising and forcing hot or cold liquids or fluids, and for exhausting or drawing in and compressing air or gas, the apparatus being also applicable as a steam or hydraulic motive-power engine, as a water-meter, as a fan, and for other purposes.

The body of the apparatus is of cylindrical form, with straight, plain sides, and is provided with suitable inlet and outlet passages or pipes. From the central portion of each side of the body of the apparatus projects a stuffing-box, which stuffing-boxes are traversed by a central shaft or axis, upon which is mounted within the apparatus the nave or boss of a circular plate or disc made of cast iron or other suitable metal, and having the form of several symmetrical segments of screws jointed together, so that it presents an undulating surface, the tops of the convex portions of the undulations constantly being in contact with one or other of the sides of the body of the pump alternately. The undulating plate or disc extends from the nave or boss upon the central shaft or axis to the periphery of the inside of the apparatus, where it forms a joint. The undulations of the plate or disc thus form, with the inner sides of the apparatus, chambers or compartments, separated one from the other by the plate or disc itself, the curved surface of which, by passing from one side to the other side of the body of the apparatus, forms partitions therein.

As it is requisite that the water or fluid acted upon by the rotation of the disc or plate, or acting upon it, should be prevented from passing completely round the apparatus, so as to return to the point where it entered and thus annihilate the useful effect, there is disposed between the inlet and outlet passages, an obturating slide or plate which traverses the body of the apparatus, the ends being contained in boxes or chests formed to receive them, one on each side of the body of the apparatus, so that it is capable of lateral alternate motion across the apparatus, and is at the same time fluid-tight. In the plate is a slot, perpendicular to the axis of the apparatus, and in the slot is a suitable swivel joint piece, through which the undulating disc passes and slides, and, from its peculiar shape and uniform thickness, is capable of rotating, and, at the same time, sliding or passing through the slot. The rotatory motion of the disc has for effect to give motion to the obturating slide or plate, which thus adapts itself automatically to the different positions of the curves.

To facilitate the sliding motion of the plate when under pressure, and to prevent its wearing, it is in some cases supported upon friction rollers, by which means its height can be regulated.

In some cases, instead of allowing the obturating slide or plate to be actuated by the rotation of the undulating disc or plate inside the apparatus, the required motion is imparted to it from the outside by means of a suitable eccentric or cam motion, or by means of an undulating plate or disc of a shape corresponding with that of the undulated plate or disc within the apparatus.

2842.—Wallace, R. W., and Claus, C. F., Southall, Middlesex, "*An improved process for utilizing gas liquor in the manufacture of carbonate of potash and other salts and sulphuric acid, and in apparatus therefor, which apparatus is also applicable for other like purposes.*" Patent dated July 25, 1877.

This invention relates to a process whereby gas liquor or gas water is utilized in the manufacture of carbonate of soda, carbonate of potash, and other salts, also in the manufacture of sulphuric acid, and comprises improvements in the construction of parts of apparatus employed for this and similar purposes.

Gas liquor partly consists of carbonate of ammonia, sulphide of ammonium, and sulphocyanide of ammonium. In the manufacture of sulphate of ammonia or muriate of ammonia from gas liquor, it is well known, the inventors state, that the gas liquor is pumped or run successively through a number or series of covered tanks or boilers, or towers, filled with coke, whilst steam, or a mixture of steam and ammoniacal vapour (that is to say, vapour of ammonia, carbonate of ammonia, and sulphide of ammonium), passes in an opposite direction through the same vessels. In its passage through these tanks, boilers, or towers, the steam, or the mixture of steam and ammoniacal vapour, becomes gradually enriched with ammoniacal compounds; and when sufficiently charged therewith, and after passing the last tank into which the fresh gas liquor is caused to flow, the ammoniacal vapours are conducted into a covered tank lined with lead, or made of stone or other suitable material, partly filled with sulphuric acid or hydrochloric acid. This vessel is called the saturator. In it, and by the contact with the sulphuric or hydrochloric acid, the ammoniacal vapours are absorbed and decomposed in such a manner as to form sulphate of ammonia or muriate of ammonia and carbonic acid, and sulphide of hydrogen gas is set free, and escapes through a pipe in the top of the saturator. These gases, in the form or condition in which they are at present obtained, are a nuisance to the manufacturer, and are not utilized in any manner, and the only way to render them innocuous is to pass them through fire and thus burn them, or treat them by the well-known oxide of iron process.

The main object of this invention is to so conduct the operation, and combine the manufacture of carbonate of potash and carbonate of soda, obtained from the sulphides of these alkalies, with the manufacture of the salts of ammonia, as to obtain valuable bye-products. This object is accomplished in the following ways, that is to say:—A solution of sulphide of potassium or sulphide of sodium is prepared either by decomposing the sulphates of these alkalies by means of sulphide of barium or solutions thereof, or by decomposing the sulphates, by means of heat, with an excess of carbonaceous matter, as hereafter explained, and dissolving the product in water. These gases, consisting of carbonic acid and sulphide of hydrogen, after they leave the saturator are passed through the solutions of sulphide of potassium or sulphide of sodium, either in another set of covered tanks or boilers (similar to those used in the manufacture of the sulphate of ammonia), or in towers filled with triangular pieces of iron or the like, as described in the specification of letters patent dated Jan. 20, 1877, No. 272, granted to the present inventors.

By the action of the carbonic acid contained in the mixture of gases, the sulphide of potassium, or the sulphide of sodium, becomes converted into carbonate of potash, or carbonate of soda, whilst a gas containing nearly pure sulphide of hydrogen is produced. The carbonate of potash or carbonate of soda solution is boiled down and calcined into salts ready for the market, and the sulphide of hydrogen being now sufficiently pure (that is to say, free from carbonic acid) to be utilized, is burnt, in suitably constructed burners, into sulphurous acid, which may be conducted into lead acid chambers to produce the sulphuric acid required for the manufacture of sulphate of ammonia, or the sulphurous acid may be conveyed into solutions of sulphide of ammonium obtained in any other suitable manner, whereby hyposulphite of ammonia is produced. By decomposing this hyposulphite of ammonia by means of acids, sulphurous acid, which may be utilized in the purification of gas from sulphide of hydrogen, is obtained.

It is preferred, however, to proceed in the following manner—namely, the ammoniacal vapours, after they leave the covered tanks, boilers, or towers, and before they enter the saturator, are caused to pass through the solutions of sulphide of potassium or sodium into another set of tanks, boilers, or towers, as described.

The carbonate of ammonia in the vapours decomposes the sulphides of potassium or sodium, forming carbonate of potash or soda, which remains in the boilers, tanks, or towers, whilst sulphide of ammonium, which is formed simultaneously, and which is volatile, escapes from the hot liquor, and passes on to the saturator to be there decomposed, as above described, into sulphate of ammonia, or muriate of ammonia, and into sulphide of hydrogen. The latter, being rich, is utilized. The carbonates of soda or potash are boiled down and calcined, as above described.

A third method of proceeding is to mix the solutions of alkaline sulphides with the crude gas liquor as it enters the apparatus. By so doing, the carbonate of potash formed will be found in the residual liquors, but in too diluted a form, and contaminated with sulphocyanide of potassium. Any ammoniacal compound remaining in the liquor may be volatilized in a separate vessel and passed into the saturator.

In making solutions of sulphide of potassium or sodium, such solutions are used over again several times, to dissolve fresh quantities of sulphate of potash or soda before adding fresh quantities of sulphide of barium, so as to obtain these sulphide solutions in a more concentrated form.

When preparing sulphide of potassium or sodium by heating the respective sulphates in the presence of an excess of carbonaceous matter, furnaces or apparatus, constructed of materials which are comparatively indestructible, are used, and it is preferred to use for this purpose blocks or bricks made of the mineral called bauxite, or the substance of which it is chiefly composed—namely, alumina.

The sulphide of hydrogen evolved in the process above described is also utilized in other ways; for instance, for the purification of sulphuric acid from arsenic, and for the precipitation of copper, silver, and lead, from its solutions, either acid, neutral, or alkaline.

For the purification of acid from arsenic, the sulphide of hydrogen, as produced by the ordinary process of manufacturing sulphate of ammonia, is also used.

The free carbonic acid, as produced in the ordinary process of manufacturing sulphate of ammonia, is also used for decomposing sulphide of barium, thus producing carbonate of baryta; or after having taken the sulphide of hydrogen away by any convenient process, the carbonic acid is used for the manufacture of carbonate of soda and potash by the ammonia process.

2843.—Lake, W. R., Southampton Buildings, London, "*Improvements in water-meters.*" A communication. Patent dated July 25, 1877.

In a water-meter constructed according to these improvements, the water passing through a case rotates a wheel, which by suitable gearing communicates its rotation to a series of dial plates, each of which rotates beneath a fixed index finger, so that instead of the usual arrangement of moveable index fingers rotating on fixed dial plates, the index fingers are fixed while the dial plates rotate.

A further improvement consists in the mode of fixing the dial plates on their spindles. Spring washers are arranged beneath the dial plates, which are fixed on their spindles by screw nuts. In consequence of the pressure of the spring washers the dials ordinarily remain fixed on their spindles; but when it is desired to arrange the dials so that certain numbers are at certain points, this can be readily effected by simply overcoming the resistance of the springs when handling the dials for the purpose.

A further improvement consists in arranging a secondary passage in

addition to the main passage for conducting the water into the chamber containing the rotary wheel. In this secondary passage a suitable valve may be provided for regulating the amount of water to be admitted. The second stream of water created by this secondary passage serves to correct irregularities in measuring.

A further improvement consists in an arrangement for preventing the water which passes through the meter from entering the chamber where the clockwork for measuring the revolutions is situated. This is effected by fixing, in the plate separating the clockwork from the meter chamber, a cup with its mouth directed towards the meter chamber. Through this cup the spindle of the measuring wheel passes into the clockwork chamber. On this spindle is fixed another smaller cup so as to protrude with its mouth into the larger cup down towards its bottom. In this way two narrow annular spaces are formed, the one passing up from the meter chamber and the other passing down from the first annular space, and thus a flow of water from the meter chamber into the clockwork chamber is prevented.

2860.—KIDD, J. and J., Wandsworth, Surrey, "*Improvements in means and apparatus for applying heavy oils to illuminating purposes.*" Patent dated July 26, 1877.

The inventors commence their specification by stating that oils or hydrocarbons of the kind known as heavy oils, distilling at a high temperature produce vapours which are superior in illuminating power to those of the lighter oils, whether they are used alone or for enriching inflammable gas; they are also less expensive than light oils, and can be employed with greater safety. It is, however, difficult to generate their vapours with regularity, and, when they are generated, to maintain them without condensation in the pipes which conduct them to the burners.

This invention relates to means of overcoming those difficulties, and to the construction of apparatus to be used in combination with burners, whereby oils of the heavy class can be employed for purposes of illumination.

The apparatus used is necessarily modified in form and arrangement to suit different cases, as for single burners or small groups of burners, or for large chandeliers, lustres, or sunlights, for open air or portable lights; but in all such cases regulated heat is provided to generate the oil vapour and means of superheating it, or maintaining it at sufficient heat to prevent its condensation on its way to the burner.

For enriching gas supplied to a single burner, or to a group of a few burners, there is provided a closed reservoir for the oil, and the gas supply-pipe is led into the upper part of the reservoir near one side or edge thereof; and very near to this pipe there is a branch bent downwards, at the lower end of which is fixed the jet or jets. From the reservoir a piece or blade of metal projects so as to be over the flame, and to be heated by it. The heat, conducted by this metal to the reservoir, generates vapour from the oil, which vapour mingles with the gas and descends with it along the branch to the jets, which heat the descending branch sufficiently to prevent condensation of the vapour.

For considerable groups of burners, as in chandeliers or lustres, the reservoir is placed above a group of jets, a shield being interposed by which the heat ascending to the reservoir can be regulated by more or less opening or closing passages through it, for which purpose it is conveniently made in the form of a turning ventilator valve. The gas supply-pipe enters the top of the reservoir, and close to it the branch for supplying the jets issues from the reservoir and descends to the jets, being kept warm by the ascending current of heated air.

The reservoir, instead of being heated by the flame of the enriched gas, may, in many cases, be heated by a separate flame, led to it by a branch from the gas-main; but in such cases the pipe which leads the vapour from the reservoir to the jets is conducted through or along the channel provided for the issue of the products of combustion so as to be kept hot.

When a row of burners supplied from a long pipe is used for illumination, the oil reservoir may be placed at one end of the pipe and heated by a separate flame, and in this case the jets from the pipe are arranged so that their flames are somewhat under to the one side of it, heating the pipe, and thereby preventing condensation of the oil vapour.

When it is inconvenient or unsafe to employ a separate flame for vaporizing the oil, as, for example, when the oil reservoir, in order to be near a ceiling light, is placed in the roof of a building, heat is conducted to it by pipes circulating hot water or supplying steam from a boiler below; and where the oil vapour or the gas enriched by it has to be led some distance to the burner, the pipe by which it is led is enclosed within the steam or hot-water pipe, or the steam or hot-water pipe passes through it so as to maintain the heat of the vapour up to the place of its combustion.

2943.—TYER, E., Finsbury, London, "*Improvements in float-valves for cisterns.*" Patent dated Aug. 1, 1877.

This invention relates to the construction of a self-acting valve worked by a float for the supply of a cistern from a water-main or service-pipe, such valve being closed by the ascent of its float when the cistern to which it is applied is sufficiently filled. On the nozzle of the service-pipe a lever is mounted, carrying a float as for an ordinary ball-cock. In a cup-shaped recess formed in this lever immediately facing the mouth of the service-pipe, is placed a ball of caoutchouc, or other suitable material, of diameter somewhat greater than the mouth of the pipe, so that when the float rises with its lever the caoutchouc ball is pressed against the mouth of the pipe, and closes it. When by frequent use the one part of the ball's surface becomes worn or unequal it can be turned round in its recess, so as to present a fresh portion of its surface to the pipe's mouth. The mouth of the pipe may be made of rectangular shape instead of round, a cylinder instead of a ball being in that case employed as the valve to close it. The mouth of the pipe may be provided with a shield to direct the issuing water as required.

2961.—GEDGE, W. E., Strand, London, "*An improved faucet or cock.*" A communication. Provisional protection only obtained. Dated Aug. 2, 1877.

This improved faucet or cock is made with a cone-shaped elastic cushion, fixed on by means of a metal shield and tapering nut, drawn into a corresponding concave seat by means of an eccentric or crank pin operated by a handle. The stem is made water-tight by means of a packing held in place by a gland and cap composed of several cylindrical portions.

3003.—TABRAR, G., Chandos Street, London, "*Improvements in galleries for gas and other lamp-glasses.*" Patent dated Aug. 7, 1877.

This invention has for its object improvements in galleries for gas and other lamp-glasses, in order to afford facility of adjustment to glasses having different sizes of feet or flanges. For this purpose one or more of the arms are formed telescopic or extensible, and springs are applied thereto, so as to cause them to spring back to or towards their normal position, whilst they are capable of being extended at will. Each arm is provided with a claw to extend over the foot or flange of the glass, and hold it in position; and, if desired, each arm may carry a portion of an ornamental flange or ring, in addition to the claw, so as to present the appearance of a circular or ring gallery.

3051.—RICHARDIN, C. H., Paris, "*Improvements in gaseliers and other pendent lights.*" Patent dated Aug. 10, 1877.

The novelty of this invention consists in the facility with which the light can be raised or lowered, the suspending rods folding one within the other in the following manner:—The suspending portion consists of three parts folding one within the other from bottom to top, and *vice versâ*. The upper part is composed of four square and hollow tubes, connected by soldering them above and below to cross pieces. The upper pieces, hollow like the lower, communicate one with the other by a connecting piece by which the gas is supplied. The lower cross piece unites with the second part of the suspender, which is formed of two hollow tubes of the same dimensions as the former. this junction is effected by cocks admitting of any circular displacement of this second part without interruption to the flow of the gas. The last or third part, formed like the preceding one of the two tubes, is articulated to the former, and so rendered solid with it, turning as desired in any direction. The lower ends of these tubes are fixed to a branch piece, forming the support to the gas or other globe and burner.

3064.—PALMER, T., and JONES, W., Harbone, "*Improvements in braces for drilling and boring, and in spanners or screw-wrenches.*" Patent dated Aug. 10, 1877.

In making a brace according to this invention, the rotating holder, in which the drilling or boring tool is fixed, is mounted in a hollow or box-like support or case, in which the tool holder rotates. To the case is jointed the working arm or handle of the brace, the arm or angle having motion through a small angle on its joint pin.

The motion given to the working handle is in a plane at right angles to the axis of the drill or borer. The end of the handle situated within the case is convex, the curvature of the end being eccentric to the centre on which it turns. The end of the handle is situated so near to the tool holder, that when it is turned upon its joint pin in one direction it bears tightly against the holder, and carries it with it in its motion, and when turned in the other direction it relaxes its hold on the tool holder, and can be moved through any angle in that direction without giving motion to the tool holder. Thus, by giving the usual reciprocating motion to the handle, it carries round the tool holder, and consequently the drill or boring tool as it moves in one direction, but leaves the drill or boring tool at rest as it makes the contrary motion. There is thus communicated to the tool an intermittent motion in one direction.

A spring situated between the inner end of the handle and the case keeps the handle in its normal position—that is, presses it against the tool holder, when the handle is at liberty to take that position. The brace is right or left handed, according to the position of the eccentric end of the handle.

In constructing a spanner or screw-wrench according to this invention, a handle is employed similar to that already described—that is, curved at its short working end, the curve being eccentric to the joint pin by which the handle is jointed to the other part of the instrument. This other part consists of a claw or grip jointed to the short end of the handle, and having externally the figure of about two-thirds of a circle, and internally the figure of four sides of a six-sided polygon. In using this spanner, it is placed so that one or more of the flat sides of the nut or screw-head shall bear upon one or more of the polygonal sides of the claw, the eccentric end of the handle bearing against the middle of the opposite face of the nut or screw-head. The nut or screw-head is thus gripped by the spanner, and can be turned.

The spanner acts right handed when the claw is on the right of the handle, but left handed when turned over so as to bring the claw on the left of the handle.

APPLICATIONS FOR LETTERS PATENT.

3722.—CROWNSHAW, W. J., Sheffield, "Improvements in adjustable spanners." Sept. 20, 1878.

3746.—WHITE, W., Chancery Lane, London, "Improvements in the manufacture of filters or filtering material." Sept. 21, 1878.

3747.—WILSON, J. G., Manchester, "Improvements in pumps for irrigating and other purposes." A communication. Sept. 21, 1878.

3748.—HAYCRAFT, G. E., Deptford, and JOHNSON, E., Greenwich, London, "Improvements in cistern filters." Sept. 21, 1878.

3768.—LAKE, W. R., Southampton Buildings, London, "Improvements in apparatus for the manufacture of gas." A communication. Sept. 24, 1878.

PATENTS WHICH HAVE PASSED THE GREAT SEAL.

1260.—KER, A. P., Birmingham, "Improvements in apparatus used in the purification of gas." March 30, 1878.

1270.—WILSON, J. G., Manchester, "An improved coupling or joint for hose and other similar pipes." A communication. March 30, 1878.

2707.—BOULTON, M. P. W., Tew Park, Oxford, "Improvements in combined gas and steam motor engines." July 6, 1878.

2908.—CLARK, A. M., Chancery Lane, London, "Improvements in apparatus for exhausting and forcing fluids." A communication. July 20, 1878.

2943.—LAKE, W. R., Southampton Buildings, London, "Improvements in lighting or illuminating apparatus, chiefly designed for use in mines, tunnels, and many storied buildings." A communication. July 24, 1878.

NOTICE OF APPLICATION FOR LEAVE TO FILE A DISCLAIMER AND MEMORANDUM OF ALTERATION.

244.—LIVESEY, J., Westminster, and KIDD, J., Wandsworth, London, "Improvements in the production of combustible gas, and in the enrichment thereof for illuminating purposes, and apparatus therefor." Jan. 18, 1878.

PATENTS WHICH HAVE BECOME VOID

BY REASON OF THE NON-PAYMENT OF THE ADDITIONAL STAMP DUTY OF £50 BEFORE THE EXPIRATION OF THE THIRD YEAR.

2856.—BUTLER, G., "Improvements in ball valves for high or low pressure water service, and for drawing off other liquids." Aug. 13, 1875.

2884.—WIRTH, F., "Improvements in water-meters." Aug. 16, 1875.

2905.—DUCKHAM, H. A. F., "Improvements in gas regulators, more especially applicable for regulating the supply of gas to the burners of railway and tram carriages." Aug. 18, 1875.

2994.—BEACH, H., "Improvements in taps known as high-pressure water-taps." Aug. 26, 1875.

3010.—BONNEVILLE, H. A., "Improvements in the manufacture of gas for lighting and heating, and in the apparatus connected therewith." Aug. 27, 1875.

3188.—SHANKS, A. F., "Improvements in and connected with water-closets, urinals, cisterns, baths, valves, and other apparatus in which water is consumed, contained, conveyed, or controlled." Sept. 11, 1875.

3199.—WILLIAMS, W., "Improvements in laying and joining pipes and tubes for tunnels, water and gas pipes, pneumatic tubes, and similar purposes." Sept. 13, 1875.

Share List of Gas and Water Companies.

(Corrected by Mr. F. N. Golding, Sun Court, Cornhill, from the latest Stock Exchange Quotations.)

Number of Shares issued.	Amount per Share.	Name.	Amount paid up per Share.	Last Divd. p.Cent. p. Ann.	Latest Quotations.
	£	Gas Companies.	£ s. d	£ s. d	£
589802	10	Alliance and Dublin	10 0 0	10 0 0	17–18
10000	20	Anglo-Romano . .	20 0 0	10 0 0	20–24
5000	20	Bahia (Limited). .	20 0 0	3 0 0	11–13
1000	20	Do., do., redeem.	20 0 0	10 0 0	25–27
1500	20	Do., 2nd pref. . .	20 0 0	7 10 0	..
40000	5	Bombay (Limited).	5 0 0	7 10 0	5⅞–6⅛
10000	5	Do., fourth issue.	4 0 0	7 0 0	4¼–5
5000	20	Bournemouth . . .	10 0 0	3 0 0	13–15
229700	..	Brentford	100 0 0	9 0 0	160–165
..	..	Do., 5 per ct. pref.	100 0 0	5 0 0	103–108
..	..	Do., C shares . .	10 0 0	9 0 0	7⅝–8¼ pm
5400	20	Brighton	20 0 0	9 0 0	33–35
5000	20	Brighton and Hove	20 0 0	10 0 0	33–35
13000	20	British (Limited) .	20 0 0	10 0 0	34-36xd.
7223	20	Cagliari (Limited).	20 0 0	6 0 0	16–18
..	10	Colney Hatch . . .	10 0 0	4 0 0	9–10
5500001.	Sk.	Commercial	100 0 0	10 10 0	175–180
70000	100	Do., 7 per cent. .	100 0 0	7 0 0	130–135
20000	20	Continental Union.	20 0 0	6 0 0	17–19
20000	20	Do., new	12 10 0	6 0 0	3–2 dis.
10000	20	Do., preference .	20 0 0	7 0 0	22–24
75000	Sk.	Crystal Palace Dist.	100 0 0	10 0 0	175-85xd
125000	Sk.	Do., 7 per cent. .	100 0 0	7 0 0	130-40xd
50000	Sk.	Do., preference .	100 0 0	6 0 0	120-30xd
7100	25	Edinburgh	25 0 0	10 0 0	51–53
23406	10	European (Limited)	10 0 0	10 0 0	16½–17½
12000	10	Do., new shares.	7 10 0	10 0 0	5–6 pm.
35406	10	Do., new shares .	5 0 0	10 0 0	3½ 3¾pm.
4094840l.	Sk.	Gaslight & Coke A.	100 0 0	10 0 0	169–171
1000001.	Sk.	Do. B.	100 0 0	4 0 0	78–82
50000	10	Do. 5 per ct. pref. conv., 4th issue.	10 0 0	5 0 0	15–16
3600001.	100	Do. do., 5th do. .	6 0 0	5 0 0	4–5 pm.
50000	10	Do. C 10 p.c. pref.	100 0 0	10 0 0	200–205
2000001.	Sk.	Do. D do. do. .	100 0 0	10 0 0	200–205
3000001.	,,	Do. E do. do. .	100 0 0	10 0 0	200–205
1650001.	,,	Do. F 5 do. do. .	100 0 0	5 0 0	98–103
300001.	,,	Do. G 7½ do. do. .	100 0 0	7 10 0	140–145
60000l.	,,	Do. H	100 0 0	7 0 0	128–132
1300000l	,,	Imperl. Continental	100 0 0	5l.p.sh.	169–172
..	..	Kingston	..	..	..
..	..	Lea Bridge	..	..	..
9000	4	Limerick Gas . . .	4 0 0	2 10 0	2¼–3
561001.	100	Liverpool United .	100 0 0	10 0 0	182–186
1691001.	100	Do., B	100 0 0	7 0 0	138–142
3349001.	Sk.	London	100 0 0	10 0 0	173–178
1622501.	Sk.	Do., 1st pref. . .	100 0 0	6 0 0	115–125
14450	Sk.	Do., 2nd pref. . .	100 0 0	6 0 0	..
4350	Sk.	Do., 3rd pref. . .	100 0 0	6 0 0	..
7622	25	Do., A shares . .	..	6 0 0	..
26692l.	All	Do., Debent. stk.	100 0 0	5l.& 6l.	..
15000	5	Malta and Mediterranean (Limited).	5 0 0	2 10 0	2–2½
6000	5	Do., preference .	5 0 0	7 10 0	6–7
20000	5	Mauritius (Limited)	2 5 0	2 10 0	1⅝–1¼ dis
25000	20	Monte Video (Lim.)	20 0 0	8 0 0	16–17
8000	10	Nictheroy, Braz. (L.)	10 0 0	5 0 0	..
30000	5	Oriental (Calcutta).	5 0 0	9 10 0	6¾–7¼
30000	5	Do., new shares .	3 0 0	9 10 0	1¼–1¾pm
10000	5	Ottoman (Limited).	5 0 0	3 0 0	2–2½
10000	10	Pará (Limited) . .	10 0 0	3 0 0	4¼–5½
27000	20	Phœnix	20 0 0	10 0 0	35–37
3600001.	100	Do., new max. 7½	80 0 0	7 10 0	111–114
1440001.	Sk.	Do., capitalized .	100 0 0	5 0 0	97–102
	20	Do., new, 1876. .	6 0 0	10 0 0	14–15pm
		Richmond (Surrey)	..	..	..
37500	20	Rio de Janeiro (L.)	20 0 0	10 0 0	22–24
1500	32½	Shanghai	32 10 0	12 0 0	30–32
..	100	Sheffield, A, B . .	100 0 0	10 0 0	206–208
..	100	Do., C . . .	100 0 0	10 0 0	202–204
12500	5	Singapore (Limited)	5 0 0	7 10 0	5¼–5⅞
2000	5	Do., preference .	5 0 0	7 10 0	5¼–6¼
4000	50	South Metropolitan	50 0 0	11 0 0	98–103
4000	12½	Do.	12 10 0	11 0 0	23–25
20000	12½	Do., new shares .	12 10 0	11 0 0	12–13
15000	10	Surrey Consumers.	10 0 0	10 0 0	pm. 17–18
10000	10	Do., new	8 0 0	10 0 0	6–7 pm.
..	..	Tottenham and Edmonton	5 0 0	10 0 0	10¼–11
1500	10	Wandsw. & Putney	10 0 0	10 0 0	16–18
1500	10	Do.	10 0 0	7 10 0	13–15
4000	10	Do.	10 0 0	7 0 0	..
..	..	West Kent	..	..	..
..	..	Woolwich, Plmstd., and Charlton . .	..	..	..
26000	5	West Ham	5 0 0	10 0 0	9–10
		Water Companies.			
615600	100	Chelsea	100 0 0	6 0 0	153–157
1624700	100	East London . . .	100 0 0	6 0 0	153–156
10798	50	Grand Junction . .	50 0 0	5 0 0	85–88
5840	25	Do., ½ shares . .	25 0 0	5 0 0	42–44
6160	25	Do., new ditto; max. div., 7½ p.c.	25 0 0	5 0 0	38–40
5551801.	100	Kent	100 0 0	8 0 0	208–212
7818001.	100	Lambeth	100 0 0	6 5 0	153–157
3261501.	100	Do., max., 7½ p.c.	100 0 0	6 5 0	149–152
442	100	New River	100 0 0	7 0 0	320–350
4475	100	Do.	85 0 0	7 0 0	280–300
400000	100	Do.,deb.sk.,4 p.c.	100 0 0	4 0 0	101–103
6668001.	100	Southwrk. & Vauxh.	100 0 0	2 0 0	108–112
3247001.	100	Do., pref. stock .	100 0 0	5 0 0	115–117
1265001.	100	Do., D shares . .	100 0 0	4 0 0	107–109
700001.	100	Do., new ordinary	..	4 10 0	..
1600	100	Do., new ord. No. 1	40 0 0	4 10 0	..
15073	61	West Middlesex . .	61 0 0	6l.p.sh.	141–144

The GRAND MEDAL of MERIT at the VIENNA EXHIBITION, and TWO MEDALS at the PHILADELPHIA EXHIBITION have been AWARDED to GWYNNE & CO. for GAS-EXHAUSTERS, ENGINES, and PUMPS;
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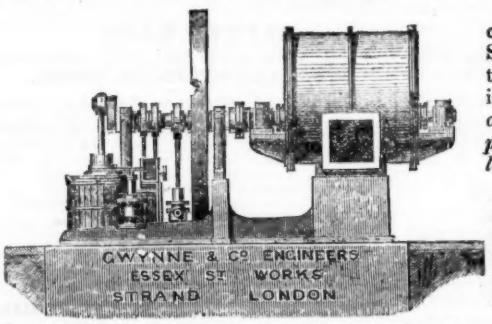

EXHAUSTER with Trunk Engine, capable of passing 210,000 cubic feet per hour.

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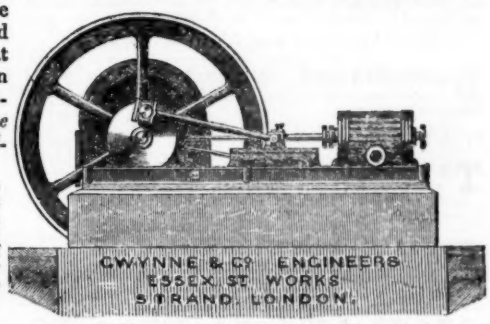

52,500 EXHAUSTER, with Horizontal Engine combined.

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Exhausters, with or without Engines combined, can be made to pass the gas without oscillation or variation in pressure Regulators, Bye-Passes, Stop-Valves, Gas-Valves, Station Governors, and Gas Machinery of all Sizes.

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Gwynne & Co.'s New Catalogue on Gas-Exhausting and other Machinery may be obtained on application at the above Address.

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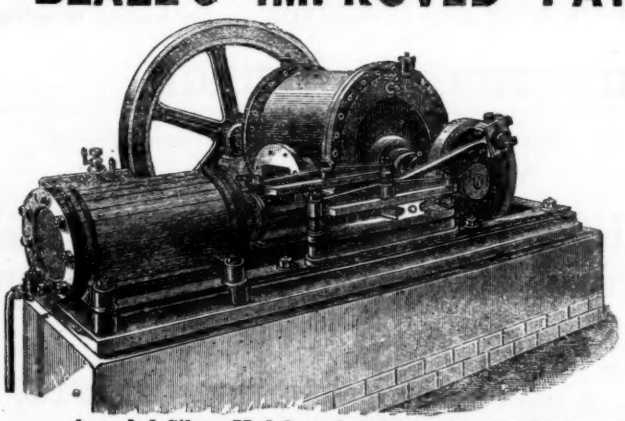

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CONDENSERS, BOILERS, &c.

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WANTED, a Man to take charge of a small private Gas-Works. Wages one guinea a week, with cottage and garden.
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WANTED, a Draughtsman. Apply to Messrs. R. Dempster and Sons, Gas Engineers, Rose Mount Iron-Works, Elland, Yorkshire, stating salary required, with testimonials and references, on or before Oct. 8, 1878.

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WANTED, a Situation as Working MANAGER or Carbonizing FOREMAN of Gas-Works. Thoroughly understands the whole of Manufacture and Distribution and the routine of a gas undertaking both indoors and out, also the erection of machinery for gas or water.
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WANTED, by Samuel Thompson & Co., Colliery Office, Lancaster, APPLICATION for PRICES from Gas Managers who are prepared to receive Tenders for GAS COAL or CANNEL.
John Leigh, Esq., M.R.C.S., F.C.S., &c., &c., in his analytical report of S. T. & Co.'s Coal, says: "It is remarkable for its purity, I have scarcely ever examined a Coal containing so small a quantity of ash, and when Cannel of the best description is scarce, it may well replace this material."

ASSISTANT, well up in the Designing, Construction, and Erection of the most improved Gas Plant, Buildings, Roofs, Girders, Steam, Hydraulic, and General Machinery, is open to an appointment. First-class references.
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Apply to Messrs. Harwar and Co., Furnival's Inn, London, E.C.

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ON SALE—A Station-Meter (with new Drum), capable of passing 10,000 cubic feet per hour, with Hydraulic Valves, Bye-Pass, &c.; 10-in. Connections. Has been removed to make room for one of larger capacity.
For particulars and price, apply to George Newton, Gas-Meter Manufacturer, Union Street West, Oldham.

TENDERS FOR TAR.

THE Pittenweem Gaslight Company invite TENDERS up to the 12th of October next for their Surplus TAR LIQUOR, per ton for Three years from the 1st of November next. Delivery on rail or at Company's works, filled into purchaser's vessels.
Address Thos. Nicolson, Secretary, Pittenweem, Fife, N.B.

STATION-METER FOR SALE.

THE Gas Committee of the Rochdale Corporation offer for SALE a STATION-METER, capacity 25,000 cubic feet per hour, 12-in. Connections, Hydraulic Valves, and Bye-Pass, and all other necessary fittings. The Meter to be removed in consequence of extensions.
Any further information thereon can be had from the Manager at the Works.
Tenders, endorsed "Tender for Station-Meter," must be sent to me on or before the 13th inst.
By order,
Zach. Mellor, Town Clerk.
Town Hall, Rochdale, Aug. 2, 1878.

TO TAR DISTILLERS AND OTHERS.

THE Directors of The Gaslight and Coke Company require the services of a duly qualified person as MANAGER of their Tar-Works at Beckton, under the supervision of the Resident Engineer of the Station.
He must possess a knowledge of Chemistry, and be thoroughly acquainted with all the details of the Distillation of Tar, and also be able, if required, to Design and Superintend any addition to the Works which may become necessary.
Salary £500 per annum.
Applications, in writing, accompanied by testimonials, stating age and experience, should be addressed to me on or before Thursday, the 10th of October.
By order,
John Orwell Phillips, Secretary.
Chief Office, Horseferry Road, Westminster,
Sept. 20, 1878.

PHŒNIX GASLIGHT AND COKE COMPANY.
NOTICE is hereby given that the ADJOURNED HALF-YEARLY GENERAL MEETING of PROPRIETORS holding, previous to the 30th of June last, £300 paid-up capital and upwards in the said Company, will be held, pursuant to the Act of Incorporation, on WEDNESDAY, the 2nd of October, at Two o'clock precisely, at the Bridge House Hotel, in the Borough of Southwark, for the purpose of declaring Dividends to the 30th of June last, and on other business.
The Transfer Books will be closed on and after the 11th of September, and opened on the 3rd of October.
By order of the Court of Directors,
Isaac Adolphus Crookenden, Secretary.
70, Bankside, London, S.E., Aug. 29, 1878.

THE BUENOS AYRES GAS COM- PANY, Louis Wilde, Agent, 42, South John Street, Liverpool.
This Agency has been removed from 4, Cable Street, to above address.
N.B.—The above-named is the Original Company, and has no connection with the Buenos Ayres Gas Company, LIMITED.

A. FAIRLIE WILSON,
CONSULTING GAS ENGINEER,
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Reports and Valuations in the Management, Construction, and Structural Value of Gas-Works.

HENRY LYON (14 years Engineer and Manager of the largest of the Manchester Corporation Gas-Works) Mechanical and Consulting Gas Engineer, reports upon the condition and value of Gas-Works, supplies plans and specifications of all Apparatus appertaining to Gas-Works, and re-models existing Works.
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NOTICE TO MANAGERS OF GAS COMPANIES.

THE LAW UNION FIRE AND LIFE INSURANCE COMPANY, of No. 126, Chancery Lane, London, grants Policies of Insurance on Gas-Works, and Buildings connected therewith, which cover risk of explosion and spontaneous ignition of Coal, on very advantageous terms. Full particulars will be sent post free on application to
Frank M'Gedy, Secretary.
126, Chancery Lane, London.

T. NEWBIGGING,
CONSULTING GAS ENGINEER,
5, NORFOLK STREET, MANCHESTER.

MR. EDWARD SANDELL,
Associate of the Society of Accountants in England,
Publisher of the
"Gas Companies Expenditure Journal,"
Begs to announce his REMOVAL from Skinner's Place, Size Lane, to
No. 2, ST. GEORGE STREET, WESTMINSTER.

W. LIDDALL,
Public Accountant,
15, UNION COURT,
OLD BROAD STREET, E.C.

Mr. ROBERT DEMPSTER, Sen.,
CONSULTING GAS ENGINEER,
Of Messrs. Robert Dempster and Sons, Rose Mount Gas Engineering Works,
ELLAND, near HALIFAX,
May be consulted on all matters connected with Valuations, Arbitrations, and Parliamentary Applications connected with Gas-Works. Our R. D., Sen., having been engaged on extensive Arbitration Cases, which, combined with his experience in Construction and Contracting, his knowledge of Engineering and Valuations, is both extensive and reliable.

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SPECIAL ACCOUNTANT FOR GAS COMPANIES,
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The above forms are registered.
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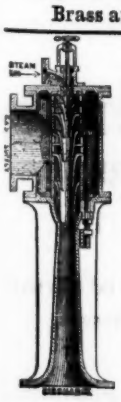

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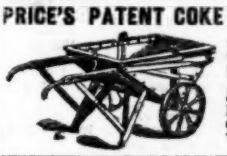

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Office: 161, Hope Street, Glasgow.

Report on the Cadzow Ell Coal.
By Dr. W. WALLACE, F.R.S.E., F.C.S., Gas Examiner for the City of Glasgow.

I have made a careful chemical analysis and practical assay of an average sample of the Ell Coal from Cadzow Colliery, received on the 5th inst., from Messrs. The Cadzow Coal Company, Hamilton, and have obtained the following results:—

Analysis.

Volatile matters	Gas, tar, &c.	34·03	
	Sulphur	·04	46·12
	Water, at 212° Fahr.	12·05	
Coke	Fixed carbon	52·90	
	Sulphur	·03	53·88
	Ash	·95	
			100·00

Coke (dry) per ton of Coal, 1205 lbs., or 10 cwts. 3 qrs. 1 lb

Analysis of the Coke (Dry).

Carbonaceous or combustible matter	96·18
Sulphur	·06
Ash	1·76
	100·00
Specific gravity of the coal	1·250
Weight of a cubic foot in pounds	77½

Practical Results.

Gas per ton of coal at 60° F. and 30 in. bar.	10,122 cub. ft.
Illuminating power in standard sperm candles by Argand jet, consuming 5 cubic feet per hour	16·76 candles.
Value of one cubic foot of gas in grains of sperm	402
Equivalent of a ton of coal in pounds of sperm candles	581
Durability of one cubic foot of gas by 5-inch flame	42 min. 45 sec.
Gravity of the gas, air = 1000	448

Remarks.

The sample tested consisted of a complete section of the seam, 5 ft. 6 in. in thickness. The results show that this Coal is well adapted for the manufacture of gas and coke, both being for soft coal of very fine quality. Of the many hundreds of coal samples I have tested, I have not hitherto had one with so small a proportion of ash as the Cadzow Coal. WILLIAM WALLACE.

Chemical and Gas Laboratory,
138, Bath Street, Glasgow, March 15, 1878.

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Torbay Brown.	Torbay Red.
Dart Green.	Slate.
Dart Yellow.	Buff.
Brixham Black.	Torbay Chocolate.
Light Blue.	Cream Colour.
Dart Brown.	Dart Umber.
Imperial Stone.	Light Stone.
Bronze Green.	Salmon Colour.
Navy Green.	Lead Colour.
Carriage Red.	Dark Stone.
Light Lead.	Crystal Palace Blue.
Light Green.	Iron Grey.

All other Colours made to order.

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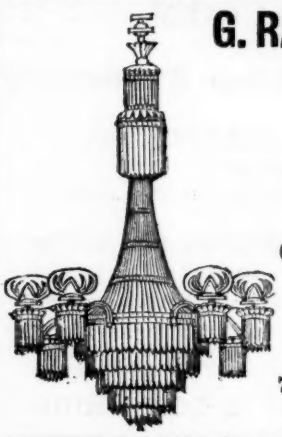
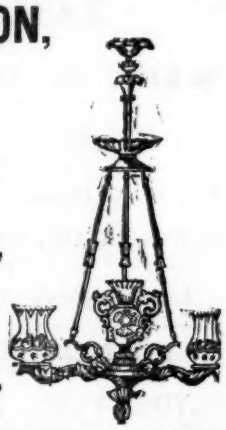


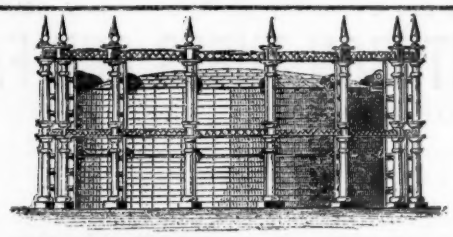
G. RAINSFORD & SON,

ESTABLISHED 1850,
MANUFACTURERS
OF
CHANDELIERS
AND
GAS-FITTINGS,
SUITABLE FOR
GAS COMPANIES.

70, BROAD STREET,
BIRMINGHAM.



ROPE IRON WORKS,



STOCKTON ON TEES.

ASHMORE & WHILE,

GAS ENGINEERS & CONTRACTORS,

MANUFACTURERS OF GASHOLDERS,

GAS APPARATUS OF EVERY DESCRIPTION,
Including Improved
Retort-Lids, Boilers, Cast and Wrought Iron Tanks, Iron Roofing, Bridges, Girders,
And GENERAL IRONWORK.

N.B.—Estimates for all Gas Plant and Remodelling supplied on application

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MANUFACTORY AND SHOW-ROOMS:

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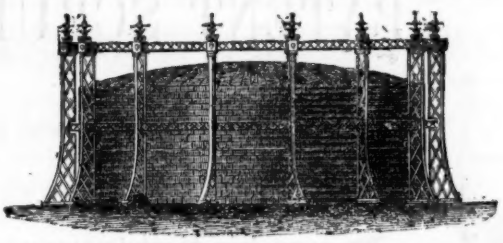
ESTABLISHED 1807.

MANUFACTURERS OF CRYSTAL GLASS CHANDELIERS.

WALL LIGHTS, AND LUSTRES FOR GAS AND CANDLES.

TABLE GLASS OF ALL KINDS.

CHANDELIERS IN BRONZE AND ORMOLU. MODERATOR LAMPS.



THE HORSELEY COMPANY,

LIMITED,

TIPTON, STAFFORDSHIRE.

LONDON OFFICE:

6, WESTMINSTER CHAMBERS, VICTORIA STREET,

GAS ENGINEERS, IRONFOUNDERS, &c.,

MANUFACTURERS OF

GASHOLDERS, WROUGHT AND CAST IRON TANKS, CONDENSERS, PURIFIERS, SCRUBBERS, MAINS, RETORT-LIDS, PLAIN AND DISHED LAMP-POSTS, PIPES,

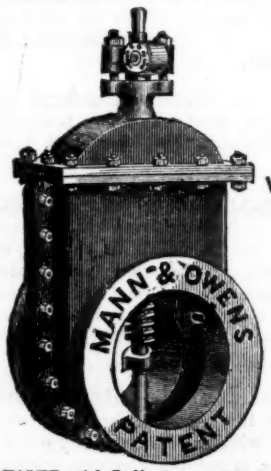
AND ALL REQUISITES FOR EITHER

GAS OR WATER WORKS;

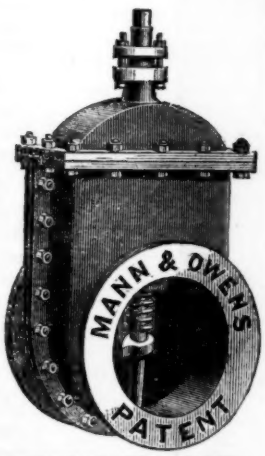
ALSO

MAKERS OF ROOFS, BRIDGES, &c.

MANN & OWENS' PATENT GAS-VALVE.



EVERY VALVE WARRANTED TO BE PERFECTLY SOUND AND GAS-TIGHT.



VALVE, with Indicator or Above Ground. UNDERGROUND VALVE.

The advantages of this Patent Valve over all others yet introduced are, that it is always as tight as the best wedge or spring valve, without the possibility of setting fast or becoming suddenly leaky. The surfaces not being in contact during the operation of opening or closing, leakage through wear and tear is avoided.

The Gas Engineer will not fail to see the importance of such a valve in connexion with his purifying apparatus, particularly in the case of large sizes.

The slide being operated either by a screw and nut, or by a pinion and rack, a cam bearing upon a plane, cast on the back of the Valve, forces it against the face, and renders the escape of gas an impossibility. By a slight turn of the pinion or screw, the slide is released, and brought away from the face, by which means friction is avoided, and the only force required to open the Valve is that due to its own weight.

SOLE MANUFACTURERS:

S. OWENS AND CO.,

HYDRAULIC AND GENERAL ENGINEERS,

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PRICES, SIZES, AND FULL PARTICULARS ON APPLICATION.

JAMES OAKES & CO.,

ALFRETON IRON-WORKS, DERBYSHIRE,

AND

WENLOCK IRON WHARF, 21 & 22, WHARF ROAD, CITY ROAD, LONDON, N.,

Keep in London and at their works large stocks of PIPES and CONNEXIONS (1¼ to 36 inches in diameter); also make and supply Retorts, Tanks, Columns, Girders, Special Castings required by Gas, Water, Railway, Telegraph, Chemical, Colliery, and other Companies.

CHARLES HORSLEY, Agent.

THE

SILICA FIRE-BRICK CO.,

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Near SHEFFIELD,

Manufacturers of THE ORIGINAL SILICA OR DINAS FIRE-BRICKS. Specially adapted for Gas-Retort Furnaces and for Siemens's Gas-Furnaces. Shipments promptly executed to London, Liverpool, Hull, Grimsby, &c.

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BRETTELL'S ESTATE

FIRE CLAY & BRICK WORKS,

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Manufacturers of GAS-RETORTS, GLASS-HOUSE FURNACE & BLAST-FURNACE BRICKS LUMPS, TILES, and every description of FIRE-BRICK.

Proprietors of

BEST GLASS-HOUSE POT and CRUCIBLE CLAYS.

Successors to

E. BAKER AND CO., LATE BRIERLEY HILL, STAFFORDSHIRE.

HARPER & MOORES,

PROPRIETORS OF THE

BEST STOURBRIDGE CLAYS,

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Manufacturers of all Descriptions of

BEST STOURBRIDGE FIRE-BRICKS, LUMPS, AND CLAY RETORTS

Of all Dimensions for Gas-Works,

GLASS-HOUSE POTS & CRUCIBLES

Of every kind.

The Highest Award was obtained by H. & M., at the Philadelphia Exhibition, 1876, for Superior Quality of Manufacture.

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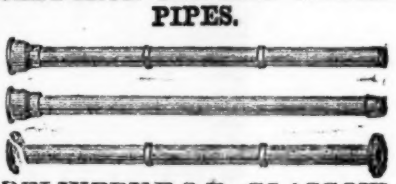
WILLIAM MACLEOD & CO.,

23 & 25, OSWALD STREET, GLASGOW.

CAST-IRON GAS AND WATER PIPES.



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Prices on application.

SLUICE VALVES.

The STRONGEST, CHEAPEST, & BEST in the TRADE.

HYDRANTS.

The Largest Variety of Improved Designs in the Market.

SPECIALITIES.

SLUICE VALVES for Water.
DO. for Gas and Sewage, 1½ to 48 in.
RESERVOIR SLUICES
AIR VALVES.
REFLUX VALVES.
BALL VALVES.
Compound HYDRANTS.
Straight-way Do.
Screw-down Do.
Ball Do.
Sluice-Valve Do.
STAND POSTS, various.
STREET WELLS.
STAND PIPES.
PATENT FIRE COCKS
STAND PIPES & JETS.
HOSE UNIONS and REELS.
LEATHER & CANVAS HOSE.
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Tested with 600 to 1000 feet head of pressure.

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COMMERCIAL BRASS AND IRON WORKS, WOODHOUSE IRON WORKS, } BRIGHOUSE, YORKSHIRE.

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C. & W. WALKER,
8, FINSBURY CIRCUS,
LONDON, E.C.

MANN & WALKERS' PATENT SCRUBBER.

By Letters Patent in Great Britain, Europe, and the United States of America.

By some important improvements recently patented, the purifying power of these Scrubbers has been much increased, and a stronger ammoniacal solution obtained, which is found to absorb a large portion of the carbonic acid contained in gas, effecting an important saving in money and labour in the lime purifiers, and where oxide only is used, the increase in the illuminating power of the gas obtained by these Scrubbers is shown in a remarkable degree, in consequence of the large quantity of carbonic acid removed from the gas.

It is to be particularly noted that the im-portant results of these Scrubbers do not depend upon the machinery alone. The entire internal construction of the Scrubber bears an almost equally important part. For this reason, where it is desirable to convert existing Scrubbers, whose dimensions happen to be suitable, the work commences by ripping out the whole of the interior of the shell, and beginning the internal construction *de novo* from bottom to top.

Fifty million cubic feet of gas per 24 hours are purified from ammonia by these Patent Scrubbers in a winter's day in the gas-works of London, where the purity of gas supply is the highest in the world, under the chemical restrictions of the Board of Trade.

Generally, wherever a high standard of purification is maintained in the chief cities and towns of the British Provinces and of Europe, these Scrubbers have become established.

By their use the department of purification from ammonia upon a gas-works is made complete, without the aid of prepared oxide of iron, chemicals in purifiers, or any other supplementary process, and the whole ammoniacal residual product contained in the coal is absorbed and obtained in the form most profitable to a gas company, while the requirements of all Acts of Parliament and of the Board of Trade, relating to incorporate gas companies, are satisfied.

Foul Gas, properly condensed, entering the inlet is, by once only passing through the Scrubber, completely purified from ammonia with regular certainty day by day, without any further trouble, or any other process, effected by a very small quantity of clear water let into the machinery room at the top of the Scrubber, which is discharged at the liquor outlet at the bottom, from Newcastle coal at about 18 to 20 ounces strength, from Yorkshire and other coals, generally from 25 to 30 ounces strength; while acidulated litmus or turmeric exposed at the Scrubber outlet will not show the slightest discoloration, and there is not a quarter of a grain of ammonia per 100 feet left unabsorbed.

They contain their own engine power, re-quiring only a small inappreciable quantity of steam from the gas-works boiler, and are then complete in themselves, ready for service.

Applications relating to dimensions and prices should be addressed to us, C. AND W. WALKER, 8, FINSBURY CIRCUS, LONDON, E.C., or to Mr. WILLIAM MANN, late Superintendent of the Chartered Gas-Works, BLACKFRIARS, LONDON; they should state approximately the largest make of gas in 24 hours or a winter's day, and the smallest make on a summer's day, to be purified.

THE AMERICAN GAS-LIGHT JOURNAL.

A. M. CALLENDER & CO., Proprietors. G. WARREN DRESSER, Editor.

Issued Semi-Monthly at No. 42 Pine Street, New York City.

This Journal is especially devoted to Gas Engineering and Manufacture, and is the official organ of the AMERICAN GAS-LIGHT ASSOCIATION, and the NEW ENGLAND ASSOCIATION OF GAS ENGINEERS.

Subscriptions at $3.50 per annum, post paid, to Great Britain, may be made direct by forwarding Post Office Money Order or Draft to the above address. Rates of advertisement, $2.00 an inch. Special rates for larger spaces.

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HOYLAND SILKSTONE COLLIERIES,

Near BARNSLEY.

This Company is now in a position to raise 2000 tons per day of REAL OLD SILKSTONE GAS COAL.

"The quality of this Coal for Gas purposes, if equalled, is not excelled by any on record, and the Coke competes successfully with best Durham."—See *Mining Journal*, Aug. 11, 1877.

Prices quoted to any Railway Station, or F.O.B. Hull, Grimsby, Goole, Keadby, Liverpool, and Fleetwood.

Full particulars will be sent on application to above address.

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MANUFACTURERS OF

WROUGHT-IRON GAS, WATER, & STEAM TUBES & FITTINGS,

STAR TUBE WORKS, HENEAGE STREET, BIRMINGHAM.

HYDRATED PURIFYING MATERIAL.

Samples on application.

MESSRS. SPENCE BROS., LIMITED,

Will be glad to supply the above on the most favourable terms, and to treat, by Purchase or Exchange, for Spent Oxide.

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ALSO PATENT DRY COPPERAS FOR EXTRACTING AMMONIA.

VICTORIA CHEMICAL WORKS, BRADFORD, NEAR MANCHESTER.

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CONTRACTORS FOR GAS & WATER WORKS, GENERAL ENGINEERS, IRONFOUNDERS & MANUFACTURERS OF

GASHOLDERS, TANKS, PURIFIERS,

SCRUBBERS, VALVES, EXHAUSTERS, IRON ROOFS, BRIDGES, BOILERS, AND GENERAL CAST AND WROUGHT IRON WORKS.

S. C. & Sons undertake the entire erection of New, or Remodelling of existing Gas-Works in any part of the World, including small Works for MANSIONS, FACTORIES, &c., or Works of the largest extent (are now constructing the largest Gasholder yet erected); also the supplying and laying of MAINS.

They make a speciality of supplying every requisite whatever for Gas-Works, keeping in Stock what are most in request. WOOD SIEVES for Purifiers and Scrubbers, of a superior make.

SPECIAL CASTINGS to Drawing or Pattern at Shortest Notice.

Manufacturers of MORRIS & CUTLER'S PATENT CONDENSER & CUTLER'S PATENT GAS-WASHER.

DESCRIPTION OF MORRIS & CUTLER'S PATENT CONDENSER.—The Condenser may consist of pipes arranged in tiers, or in any other form most convenient to the site available, each tier being connected with special connections, and containing within same either one or more coils of smaller pipe through which water is passed, being supplied from any convenient source of supply, the water passing in an opposite direction to the gas, so that the coldest water is at the gas outlet. The power of the Condenser can be regulated precisely in proportion to the quantity of water allowed to pass through, which is not in any way contaminated, but simply heated by the hot gas, and advantage can be taken of its being at a high level to carry it to a high-level cistern, from whence it can be used for supply to boiler or any other purpose. The Condenser itself may form the support for a high-level cistern. By an arrangement of valves the water may be shut off, and an air orifice opened, when air will pass through instead of water, or both air and water can be shut off. The power of the Condenser is, therefore, entirely under control. The Condenser may be seen in operation at the Brentford Gas-Works.

For further Particulars, apply to Mr. F. MORRIS, GAS-WORKS, BRENTFORD, or to S. CUTLER & SONS, PROVIDENCE WORKS, MILLWALL (Near the Steamboat Pier), LONDON, E.

TO GAS AND RAILWAY COMPANIES, LOCAL BOARDS, ENGINEERS, CONTRACTORS, SHIPPERS, &c.

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SOLE PROPRIETOR AND MAKER OF

KEEN'S PATENT DOUBLE-FRAME CLIP-LAMP,

AND MANUFACTURER OF

EVERY DESCRIPTION OF STREET-LAMPS.

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Yields 12,500 cubic feet of 34-candle gas per ton, and 9 cwts. of excellent coke, containing only 4 per cent. of ash.

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Yields 12,160 cubic feet of 32·5-candle gas per ton, and 10 cwts. of excellent coke, containing only 5 per cent. of ash.

OLD WEMYSS CANNEL

Yields 13,320 cubic feet of 32·5-candle gas per ton.

Prices and full Analyses on application.

GAS COAL.

POPE & PEARSON, LIMITED, have now the authority of several of the most eminent Gas Engineers of London in stating that their Coal yields *in practical working over* 10,000 *cubic feet of gas, with an illuminating power of* 16 *candles;* or by the standard burners now used by the London Gas Companies, an illuminating power equal to 17½ candles.

One ton yields 12½ cwt. of good coke. This Coal can be shipped from Hull, Goole, Liverpool, Morecambe, and Barrow.

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The Subscriber is prepared to contract for the supply of all the principal SCOTCH CANNEL COALS. Prices and Analyses of the various Coals will be forwarded on application.

JAMES M'KELVIE,

CANNEL COAL MERCHANT,

HAYMARKET, EDINBURGH.

Established 1840.

DEAN'S PRIMROSE GAS COALS.

South Metropolitan Gaslight and Coke Company, London, July 12, 1878.

The Owners of the Dean's Primrose Colliery.

Dear Sirs,—I have much pleasure in stating that this Company have regularly used your Coals for more than thirty years, and that in all essential particulars they give the most satisfactory results.

The yield of Gas is from 9700 to 9800 feet per ton, of full 16 candles illuminating power, tested by the London Referees Standard Burner; and the Coke is of very good quality, while the quantity is about 40 bushels to the ton of Coal.

I consider Dean's Primrose Coals to rank amongst the first-class Gas Coals from the Durham Coal-Field.

Yours truly, GEORGE LIVESEY.

These Coals are also used by The Gaslight and Coke Company (London), and other English and Foreign Gas Companies.

Steamers loaded with quick despatch in the River Tyne. Price and other terms on application at the

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At the request of Mr. Hedley, the owner of the Holmside Colliery, I have much pleasure in stating that, for about ten or twelve years past, this Company has taken at least half of its supply of Newcastle Coal from him. I can, therefore, confidently bear testimony to the good quality of the Holmside Coals, and consider they are equal to the best of the Newcastle Coals, in proof of which I may state that this year we are using those Coals exclusively, that the yield of Gas is from 9700 to 9800 feet per ton, and that the quality of the Gas, without any admixture of Cannel, is over 16 candles, as tested by the officer appointed by the Metropolitan Board of Works, using the London Gas Referees test.

The Coke is of excellent quality, and in quantity amounts to about 40 bushels from a ton of Coal.

The annual consumption of Coal amounts to about 75,000 tons.

GEORGE LIVESEY, Engineer and Secretary.

P.S.—I am at this date, Feb. 15, 1875, still using Holmside Coals as largely as ever, and am quite as well pleased with them as when I gave the above certificate.

GEORGE LIVESEY.

We are this year, 1878, using 80,000 tons of Holmside Coal. GEORGE LIVESEY.

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All negotiations respecting M. Brémond's patented process for preventing Deposits of

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148 GRESHAM HOUSE, OLD BROAD STREET, LONDON, E.C.,

AGENT FOR

THOMAS BARR'S LESMAHAGOW MAIN CANNEL,

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NEWTON, CHAMBERS, & CO.'S SILKSTONE GAS COALS.

Analyses and Quotations on application.

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Supply to any Railway Station or for Export all kinds of Fuel for Gas purposes.

Address—CHIEF OFFICES:

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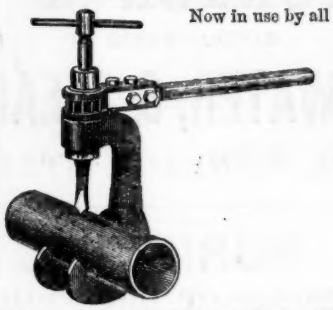
GREAT SAVING OF LABOUR.

ENOCH'S PATENT

PORTABLE DRILLING-MACHINE,



Now in use by all the Principal Gas and Water Companies in the United Kingdom.

E Size, for Services in Pipes, 2 to 3 in. bore	£3 10 0
F Size, for Services in Pipes, 2 to 4 in. bore	4 0 0
G Size, for Services in Pipes, 2 to 6 in. bore, with Telescope Cramp.	4 10 0

Drills, 1s. 6d. each.

Machines sent on approval, if desired.

Prices for other Sizes and Modifications, with full Particulars and Testimonials, on application to

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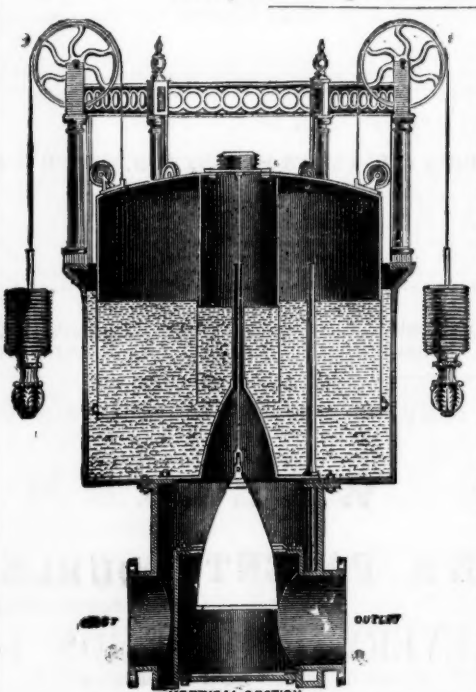
GLOBE METER-WORKS,

OLDHAM,

Beg to submit to Gas Engineers their

PATENT COMPENSATING GAS GOVERNOR,

Which is designed to give an uniform pressure at the Outlet to the Main at all draughts up to the full quantities which the Governors are made to control, such outlet pressure being less than the initial pressure.



VERTICAL SECTION

The uniformity of pressure is obtained by introducing a compensating chamber into the Bell or Holder of the Governor, which compensator is of the same area as the valve, both of which are operated on by the initial pressure, thereby placing the valve in equilibrium, no matter what the initial pressure may be. The action on the Bell is by the Gas passing along a pipe from the outlet, and the pressure is regulated by weights in connexion with the Bell as required.

From the sectional elevation attached hereto, it will be seen that only the Gas required to operate the Bell comes in contact with the water of the tank, which water will remain comparatively sweet and free from odour. That in case of accident to the Bell, no more Gas can escape than would pass up the pipe covering the valve-rod and Bell supply-pipe.

These Governors have been made and sent out of various sizes for from 2 to 24-inch Mains, and give most satisfactory results.

They can be made with Float in the Bell, or counterpoise as per section.

THE SILKSTONE & DODWORTH COAL & IRON COMPANY, LIMITED,

DODWORTH, BARNSLEY.

BENJAMIN WHITWORTH, Esq., M.P. . . . . Chairman.
Mr. RICHARD HARTLEY . . . . . Managing Director.

REAL OLD SILKSTONE GAS COAL.

JAMES PATERSON Esq., Gas Engineer, of the Warrington Gas Company, reported, Aug. 10, 1875:—

"This Coal possesses remarkable qualities as a gas and coking coal, and appears SECOND TO NONE IN THE KINGDOM. It contains the large quantity of 699 lbs. of illuminating matter, and 1498 lbs. of coke to the ton, and produces **12,240** cubic feet of 16·66 candle gas."

The above Company are raising nearly a thousand tons of the Real Old Silkstone Gas Coal per working day.

PRICES QUOTED TO ANY RAILWAY STATION, OR F.O.B. HULL, GRIMSBY, GOOLE, KEADBY, LIVERPOOL, AND FLEETWOOD.

ALDER AND MACKAY,

GRANGE WORKS, EDINBURGH,

MANUFACTURERS OF

CONSUMERS IMPROVED GAS-METERS;

IMPROVED DRY GAS-METERS, in Cast-Iron and Tin Cases,

OF THE HIGHEST EXCELLENCE,

Warranted to measure correctly, and not to vary.

STATION METERS AND GOVERNORS,

EXPERIMENTAL METERS, PHOTOMETERS, GASHOLDERS, &c.

Established

1795.

JOSEPH CLIFF & SONS,

THE ORIGINAL

WORTLEY FIRE-BRICK WORKS,

NEAR LEEDS,

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LIVERPOOL: Back Leeds Street.

SPECIAL NOTICE.—Our Patent Machine-made Retorts have now been in *actual work* nearly 1000 days, and are yet in good order. References on application.

July 2, 1877.

NEWTON, CHAMBERS, & CO.,

THORNCLIFFE IRON-WORKS AND COLLIERIES,

NEAR SHEFFIELD.

CELEBRATED SILKSTONE GAS COALS.

The various descriptions of Gas Coal produced from the above Collieries possess an unequalled reputation, combining in a large degree the constituents essential for the production of the best quality of Coke and Gas of a high illuminating power.

A recent extensive development of the Collieries enables us to offer increased supplies.

JAS. PATERSON, Esq., of Warrington, after testing various qualities of our Coal, has sent the following testimony of their merits:—

"*Warrington Gaslight and Coke Company,*
Offices, Mersey Street, Warrington, April 23, 1877.

"MESSRS. NEWTON, CHAMBERS, AND CO.,

"GENTLEMEN,—After carefully testing the various samples of Gas Coals sent from your Collieries for analysis, I have pleasure in reporting them as belonging to the highest class of Gas and Coking Coals.

"The average of Nine samples gives a yield of **12,500** cubic feet of **15½**-Candle Gas, being equivalent to **664** lbs. of sperm per ton, and **1420** lbs. of fixed carbon of a very superior quality. All the samples bear a close relation to each other in value.

"Yours truly, "JAMES PATERSON."

Full particulars will be sent on application to us—address as above.

CROLL'S

DRY GAS-METERS,

PRIZE MEDALS.
LONDON, 1851;
NEW YORK, 1853
PARIS, 1855.

(INVENTED & PATENTED IN 1844,)

COMBINING ALL THE LATEST IMPROVEMENTS,

MANUFACTURED ONLY BY

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LONDON 1862;
DUBLIN, 1865;
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THE GAS-METER COMPANY, LIMITED,

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ALEXANDER WRIGHT & CO.,

MANUFACTURERS OF

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